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Cutting Hunger in Africa Through Smallholder-led Agricultural Growth

A Technical Paper in Support of
USAID's Agricultural Initiative to Cut Hunger in Africa (AICHA)

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Executive Summary

The situation in Africa is dire and deteriorating. A staggering one in three people and a third of all children are undernourished and more than one half of all Africans live on less than one dollar per day. Africa is the only continent where hunger and poverty are projected to get worse. Hunger and poverty reinforce each other in a vicious downward spiral that limits people's ability to grow food or earn the money to purchase it. Worsening poverty and hunger also contribute to environmental degradation, conflict and the spread of HIV/AIDS and other infectious diseases.

Although there are many contributing factors, the poor performance of the agricultural sector lies at the heart of the problem. Agriculture accounts for 70 percent of full-time employment in Africa, 33 percent of total GDP, and 40 percent of total export earnings. Yet its performance in recent decades has been one of the worst in the world. The gap between land and labor productivity in Africa and other developing regions is large and is widening at an alarming rate. Per capita output of staple foods continues to fall and Africa is steadily losing its world market shares for traditional export crops like coffee, tea and cocoa.

With business as usual, chronic poverty, food insecurity, and child malnutrition will worsen significantly. Resources will become more degraded and land productivity will decline further in many areas. Crises and violent conflicts will increase, disrupting agriculture, creating refugees, escalating the need for and costs of emergency relief, and diverting investment from the long-term solutions Africa so desperately needs to end its cycle of despair.

It doesn't have to be this way. IFPRI's global food model projections show that a smallholder-led agricultural transformation of Africa is technically and economically feasible and could reduce child malnutrition in Africa by 40 percent by 2015 (in line with the Millennium goal). Yet historical missteps have made policymakers and donors skeptical about the realism of achieving this vision. Any attempt to revitalize investments in African agriculture must provide convincing answers to such questions as what has been learned from the past? What will be different now and in the future? What will it take?

Lessons Learnt

A key lesson from the past is that agricultural growth requires an enabling policy and economic environment. But simply getting prices right, a primary emphasis of many structural adjustment programs (SAPs) in the 1990s, is not enough. There is also a complementary need for sustained public investment in the supply-side of agriculture and for effective public and private institutions, without which there is little aggregate supply response. Public investment in agriculture has fallen badly in recent decades leaving Africa with only a fraction of the rural infrastructure and human and technological investment it needs for growth. The abrupt withdrawal of the state parastatals and of subsidized inputs has also left a vacuum in many agricultural marketing and input supply

services that the private sector has not yet been able to fill. The private sector could play a larger role if it were not also constrained by poor infrastructure and weak legal, regulatory and financial institutions. Many donors have sought to work more directly with private firms and NGOs in recent years, but in so doing have been negligent in helping to strengthen public institutions so that they can play their properly defined roles.

One of the more successful outcomes in recent decades has been the role of agricultural research in generating technological change. Higher yielding and more drought and pest resistant varieties helped increase food supplies, even if not at a sufficient rate to keep up with population growth. Despite these successes, many national research and development (R&D) systems are still poorly positioned to address the important natural resource management problems that now confront African farmers. Furthermore, R&D for traditional export crops has failed to raise productivity growth in recent decades, contributing to a loss of competitiveness in world markets and a decline in market shares. Africa's heavy dependence on a few traditional agricultural export crops renders it vulnerable to downturns in world prices, while its general terms of trade for agriculture has also been affected by the protectionist agricultural policies of many OECD countries.

The challenge for stimulating a smallholder-led growth in Africa also needs to go beyond simply addressing smallholder agriculture. Building local human and institutional capacity is essential. Investments in rural health services are critical as well. Rapid population growth has been accompanied by the spread of human diseases like Malaria and HIV/AIDS which are taking a tremendous toll on public social services, labor productivity and household savings. Agricultural development can provide the resources for rural people to improve their health and nutrition – but so can improvements in the health of rural people increase their productivity and the prospects for successful agricultural intensification. In this regard, investing in women's welfare is critical, given that women in rural Africa are both farmers and nutritionists and yet are often biased against in terms of access to economic inputs and services. Therefore, any strategy to reduce child malnutrition will need to seriously address some of these past gender biases.

With poverty and environmental degradation on the rise in Africa, civil conflict has also risen, which has now become a major factor contributing to the high incidences of hunger and poverty on the continent. What is also needed are long-term development solutions targeted at the most severely affected and vulnerable populations. Already the cost of disaster assistance is becoming a major financial burden for many governments and donors, and the cost will continue to escalate as more people live in vulnerable areas and as global climate change increases the frequency and severity of many natural disasters.

The Way Forward

What Africa needs is a different approach for development – one that addresses in an integrated way the pressing economic, social and environmental problems facing the

continent as it enters the 21st Century. There is now a growing consensus that the new approach must be less dependent on government direct intervention but rather based on participatory development approaches, civil society, market forces and key partnerships between stakeholders. Governments are expected to focus on creating an enabling environment in which other agents can operate efficiently, and to refrain from undertaking activities that others can do better. They need to create the right kind of economic incentives through national and regional economic policies, establishing conducive legal, governance and institutional arrangements (including decentralization), and partnering with other stakeholders in providing public goods, environmental supervision and targeted assistance for the poor. Within this enabling environment, NGOs, CBOs, and some private agents and specialized government agencies can then focus their efforts and work together in supporting community development activities and assisting disadvantaged groups gain greater access to resources and markets.

The emerging consensus about how best to approach agricultural development in Africa is buoyed by existing and new opportunities for agricultural growth in Africa. The continent is still blessed with abundant natural resources on a per capita basis, which provide an important source of as-yet untapped growth potential. Yields are currently so low in Africa that there are plenty of opportunities to raise them through technological change. There is considerable scope to apply already available technologies if conditions for more widespread adoption can be improved. The application of conventional plant breeding and NRM research can raise yields even further. And there are also many opportunities for research to help reduce post-harvest losses (processing and storage technologies). Properly tapped, biotechnology also offers considerable long-term potential to address many of Africa's challenging production and environmental problems, and to ensure sustained increases in productivity over time.

The revolution in communications and information technologies also offers exciting new opportunities. Through rapid and timely exchange of knowledge and information, it accelerates the process and quality of technology generation, it facilitates timely up-to-date market information to those who need it most – farmers and entrepreneurs, and it accelerates the process of relevant and appropriate technology transfer. Globalization is bringing new market opportunities. World markets are far more integrated today than ever before and the volume of world agricultural trade has more than doubled since 1981. Given its natural comparative advantage in producing many export crops, Africa should, with the right mix of domestic market reforms and institutional and infrastructure investments, be able to reclaim larger market shares.

Not only has the world changed dramatically over the last decade, Africa has also changed. First, in the aftermath of structural adjustment programs to remove costly public support services, various African governments have been experimenting with new institutional innovations built around private/public partnerships to help fill the void. Second, governments are also increasingly decentralizing authority to the local level, allowing rural communities to influence decisions that are relevant to their needs. Thirdly, many African countries are also instituting democratic principles of governance, and committing themselves to reducing hunger and poverty. They are well on their way

to creating the type of enabling environment necessary for nurturing a dynamic business and private sector. Fourth, many African countries are now more firmly committed to reducing hunger and poverty than at any other time in the past. Finally, for the first time since independence, development solutions are increasingly being sought from a sub-regional perspective. This change of attitude has opened the door for many more countries to benefit from greater economic integration and to capture spillover benefits from the exchange of technology and information. For example, the emergence of the New Partnership for Africa's Development (NEPAD) is a promising joint partnership among Africa leaders that shows Africa's renewed countrywide commitment and a desire for ownership of future development priorities.

Although we know much more about how to develop African agriculture today, there is no single one-size-fits-all strategy. There are certainly many common fundamentals (or pillars) that are shared across countries and regions in Africa, but nevertheless, each country and sub-region (East, West and Southern) will need to tailor their own national and regional plans to local specific conditions. To ensure success, development strategies needs to set in place a dynamic planning and learning process, strengthening both country and donor capacity for this type of work in the process. This will require rigorous data collection, analysis and planning; effective monitoring and evaluation (M&E) systems; and a capacity to revise and adapt plans over time. The possibilities for such an informed approach to guiding development strategies are much greater today and are constantly improving. The evolution of modern information systems, computing power and scientific methods have opened up whole new opportunities for collecting and using information in intelligent and useful ways. National capacities to undertake this kind of work have also improved. The key remaining challenge is to find institutional mechanism through which this information and knowledge can be harnessed and better linked to the work of planners within key government and donor agencies.

With business as usual, poverty, food insecurity and child malnutrition will worsen significantly in Africa. Resources will become more degraded and land productivity will decline further in many areas. Crises and conflicts will increase, leading to escalating costs of relief. This is not a tolerable prospect. In the early 1960s, Africa was the continent of hope and Asia the continent of despair. Asia has shown what can be done and now Africa must move forward. This will not only require that African policy makers realign their priorities towards a greater emphasis on agricultural growth, but major donor like the US need also to step in with significant and sustained levels of support. The Agricultural Initiative to Cut Hunger in Africa is an excellent step in the right direction.

I. Introduction

Sub-Saharan Africa (hereafter referred to as "Africa" for simplicity) is badly lagging the rest of the developing world in economic growth and in its reduction of poverty, food insecurity and child malnutrition. The incidence of hunger, malnutrition and poverty is among the highest in the world, and Africa is the only continent where things are projected to get worse (USDA, 2002), making it one of the most significant development challenges facing the world today.

The combined problems of hunger and poverty form a vicious downward spiral, limiting people's ability to earn income and purchase food and affecting the most vulnerable – pre-school children. Ultimately, the quality and productive life of millions of Africans is significantly affected. The problem is compounded further by high rates of growth in the rural population and numbers of people affected by HIV/AIDS and Malaria, both of which are among the highest in the world and threaten to reverse the human and social achievements of the last three decades. Environmental degradation and civil conflict, themselves often linked to poverty, are found across much of Africa and add other dimensions to the problems of hunger and rural poverty and increasing the burden of emergency relief efforts.

Given that agriculture is the single most important source of rural livelihoods in Africa, a smallholder-based agricultural growth strategy will go a long way to reducing hunger and poverty on the sub-continent. Success will not only come from greater investments in agriculture, it will also require sustained investments in health, education, environment, infrastructure and sound policies. Partnership with and among committed African governments and the private sector is essential.

Building on lessons learned and best practices -- Africa needs a clear objective of reducing hunger and poverty through the rapid acceleration of smallholder-led agricultural growth. It needs a development framework that embodies a new way of doing business, a framework that lays out a clear path for setting investment priorities, and a framework that uses the best information and analysis available on what works to raise rural incomes and effectively reduce poverty and hunger across the entire sub-continent.

Things are very different today than they were a decade or so ago. First, there are many more new opportunities today for Africa to seize, from new advanced technologies to new global markets. Second, there is a much better understanding of what needs to be done and how. And finally, the will and commitment by donor and African governments to get agriculture moving in Africa has never been better. A smallholder-led growth strategy for Africa can build on these positive changes, calling for a partnership and commitment with other donors, and African leaders and their governments, to work and invest together to achieve the goals of cutting hunger in Africa. A coordinated multi-donor response is needed, one that is articulated from Africa, by Africans, and one that represents a broad global alliance committed to the same goals. A good starting place for

a coordinated international response is to engage with the New Partnership for Africa's Development (NEPAD) on an on-going basis.

Without the kind of significant increase and commitment to agricultural led growth, poverty, food security and child malnutrition will worsen significantly on the continent. Resources will become more degraded and land productivity will decline further in many areas. Crises and conflicts will increase, leading to escalating costs of relief and potential spillovers to the stability of global economic systems and security. Reversing these trends is not only feasible, but would also be good for developed countries' businesses and economies as well. In the early 1960s, Africa was the continent of hope and Asia the continent of despair. Asia has shown what can be done and now Africa must move forward.

This paper reviews the challenges and opportunities for cutting hunger in Africa through a smallholder-led agricultural growth strategy. It begins by presenting the problem and context of hunger in Africa and the various future scenarios and options for addressing this problem. A review of the lessons learned and experiences from past development efforts is followed by a review of the empirical evidence on the linkages between agriculture, poverty and growth within a smallholder-led agricultural growth strategy. Strategic options necessary to raise smallholder-based rural incomes and cut hunger in Africa are reviewed in the context of what works best, before concluding with a framework for implementing a smallholder-led growth strategy. Finally, to help instill some rigor and coherence in the design, monitoring and evaluation of agricultural investments, a conceptual analytical framework is presented within the context of USAID's Agricultural Initiative to Cut Hunger in Africa (AICHA).

II. Setting the Context

The Hunger Challenge

A staggering one in three people in Africa are currently undernourished, equivalent to one third of all the undernourished people in the world, and affecting more than half of the countries on the subcontinent (see Figure 1). By 2010, 63% of the world's undernourished population is projected to live in Africa (USDA 2001).

The most vulnerable group among the hungry population is pre-school children. Hunger and under-nourishment during the first five years of life causes underweight and stunting in children (UN/IFPRI 2000). Stunted children are more vulnerable to illnesses like diarrhea and pneumonia, and mental and physical stunting in childhood can affect a person's productive capabilities for life. About 33 million African children are currently malnourished, or one in every three children (Smith and Haddad 2000). Africa's childhood mortality rates are also among the highest in the developing world, about 151 per 1,000 deaths compared to 89 for South Asia (Figure 2). Malnutrition and its consequences have not improved in Africa in the past thirty years.

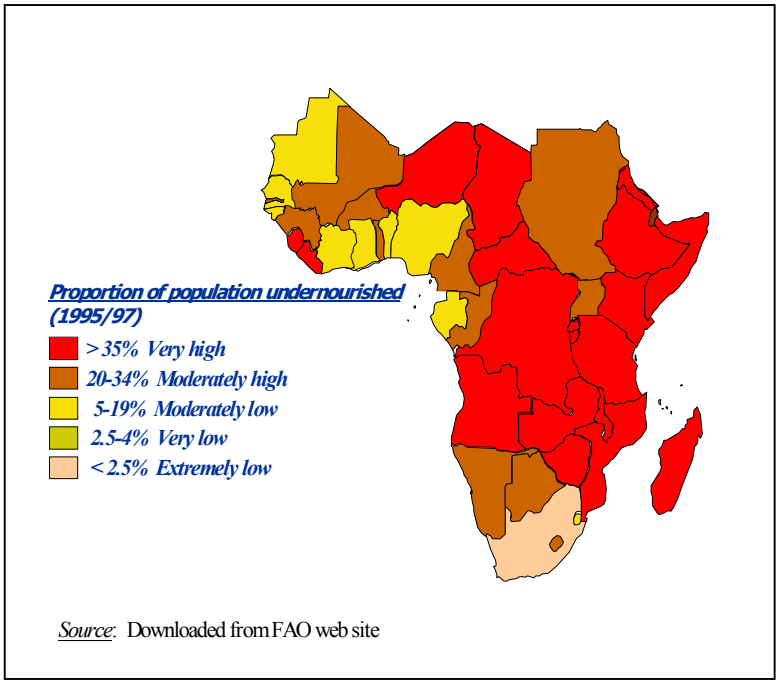

Figure 2 The prevalence of hunger is widespread across Africa

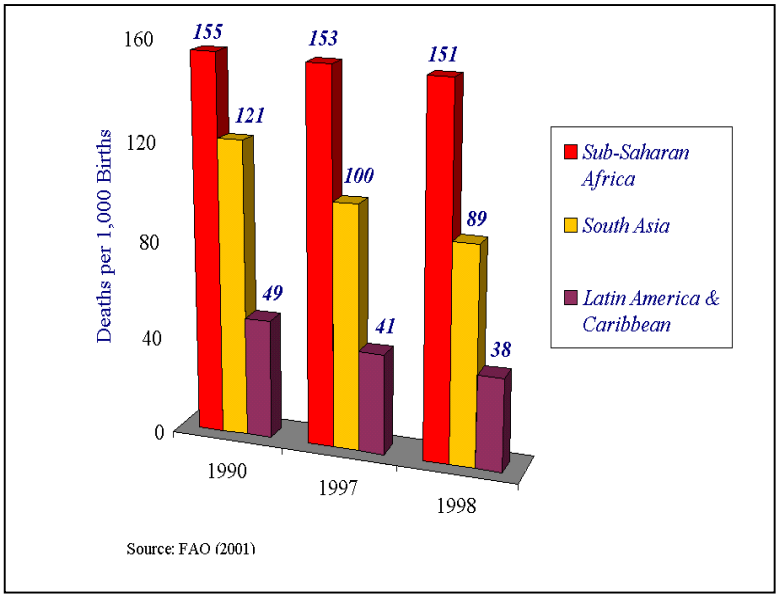

Figure 1 Mortality rate of Children Under Five (deaths per 1,000 births)

Hunger is driven primarily by poverty; many people simply do not have sufficient income to buy the food they need. Eighty percent of all Africans live on less than $2 per day, and about half live on less than $1 per day. Poverty and hunger are also linked in a vicious downward spiral. Poverty limits people's ability to purchase food while malnutrition and poor health limit their ability to earn income, causing irreversible poverty (Masters 2001). Poor people are particularly vulnerable during droughts (e.g. Malawi) and civil conflict (e.g. the Democratic Republic of Congo).

Beyond the numbers and statistics, hunger and poverty are taking a tremendous toll on the heart of Africa – its people, communities and government. They are threatening political stability and fueling civil conflict in many parts of Africa and generating millions of displaced populations. In 2001 alone, ongoing conflicts were reported in 11 out of 15 African countries facing severe food shortages (FAO 2002). There are certainly strong links between conflict, poverty and hunger, caused by the abrupt disruption of markets and prevention of food distribution systems (Messer, Cohen and Marchione 2001). But even in more peaceful countries, a deteriorating state of infrastructure, access to productive assets, health services, and education has left many rural people facing persistent threats of hunger and poverty.

The widespread threats of major infectious diseases like Malaria, tuberculosis and HIV/AIDs have raised mortality rates to levels not seen in three decades. Children are especially affected; the highest mortality rates from malaria are among children under 5, for instance. Even in areas with stable Malaria cases, it explains 25% of the mortality among children under 4 (WHO, cited in Sachs and Malaney 2002).

Another devastating disease, HIV/AIDS, has claimed the life of an estimated 7 million agricultural workers since 1985, and is projected to reduce the agricultural labor force by another quarter or so by 2020 in some African countries. The disease has been estimated to increase child mortality rates in Africa by as much as 20% (WHO, cited in the 'Time is Now' by the Partnership to Cut Hunger and Poverty in Africa 2002). The total costs of infectious diseases to rural Africa are staggering in terms of human suffering, lowered economic productivity, and lost intellectual resources. These problems pose both old and new dilemmas for achieving sustainable agricultural development and economic growth on the continent.

A Stagnant Agriculture

Although there are many contributing factors to Africa's poverty and hunger, the poor performance of the agricultural sector lies at the heart of the problem. Still about 80% of all Africans depend on agriculture in one way or another for their livelihoods, and the sector accounts for 70% of full time employment, one third of total GDP, and 40% of total export earnings. A stagnant agriculture inevitably leads to economic stagnation for most Africans and results in persistent threats of poverty and hunger.

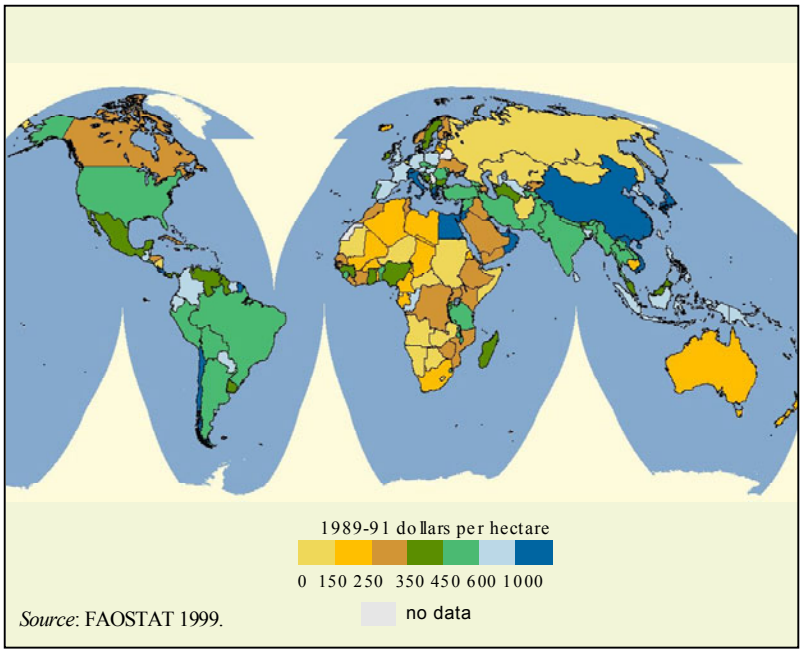

Figure 3 Value of Land Productivity ($ per ha)

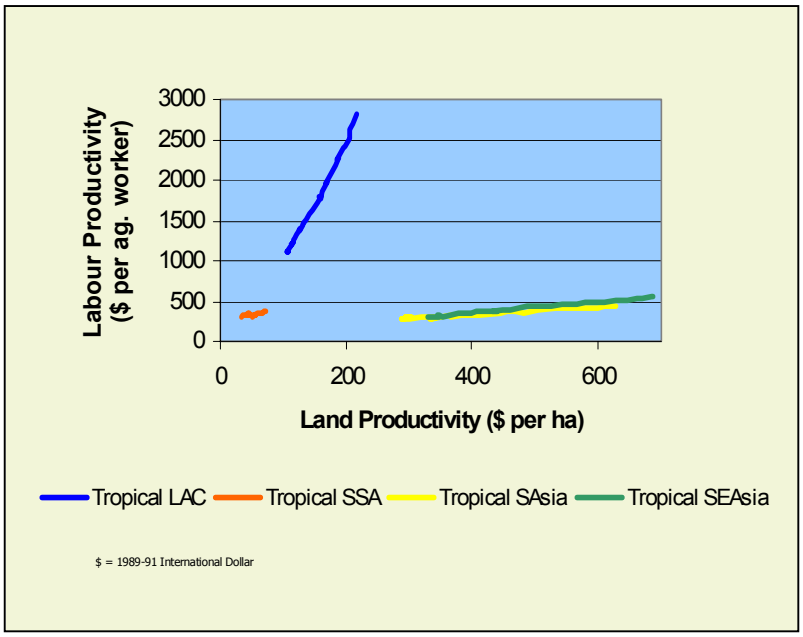

Figure 4 Labor and Land Productivity in Agriculture, 1961-97 (*Source*: IFPRI)

There are many indicators of agricultural performance and Africa lags the rest of the world on most. Africa has some of the lowest levels of land and labor productivity in the world and these have barely changed in 30 years (Figures 3 and 4); declining per capita output levels, especially of staple foods (Figure 5); some of the lowest use rates of chemical fertilizers with serious nutrient mining and declining soil fertility (Figure 6), which in turn is related to low yields; and Africa is badly losing world market shares for its traditional export crops, even as prices fall (see Figure 7).

The picture is not all bad, however. Several important successes have been achieved in African agriculture as recorded by Gabre-Madhin and Haggblade (2001). And as will be shown later, past research and development efforts have shown high payoffs that are not very much different from other developed and developing regions of the world. But, these successes have been limited in scale and have not always been sustained over time, and have not had the required impacts to influence the broader statistical characterization of African agriculture.

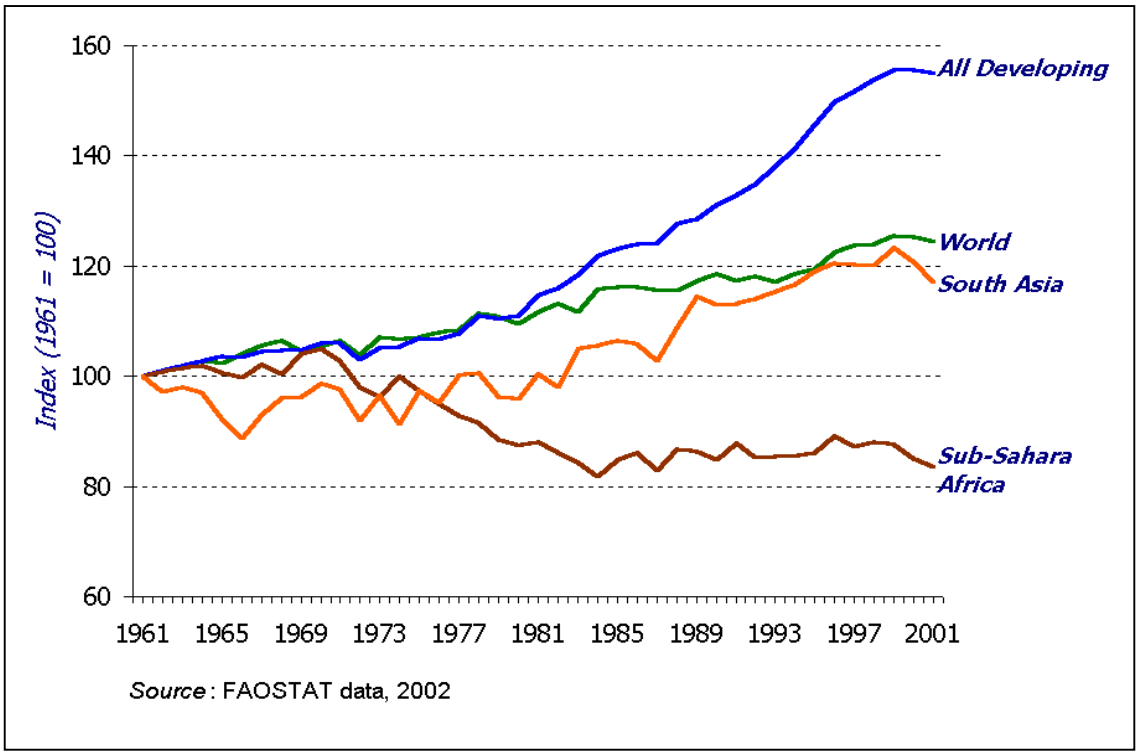

Figure 5 Value Index of Per Capita Agricultural Production (1961-2001)

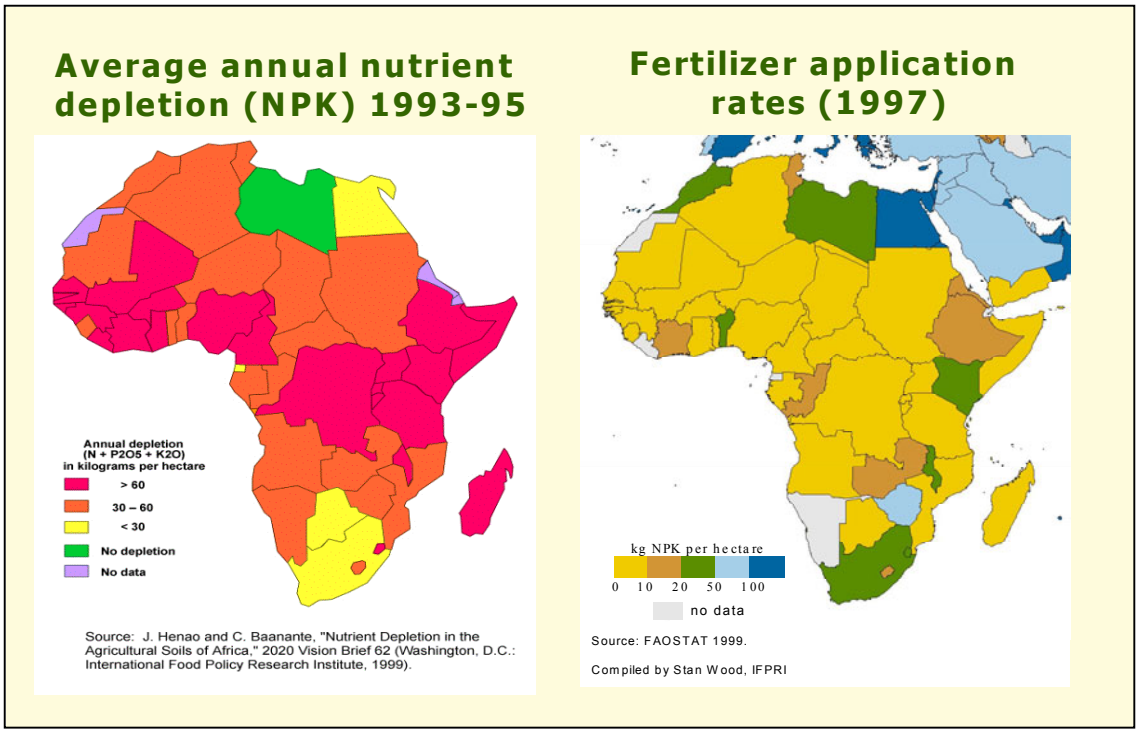

Figure 6 Soil Nutrient Depletion and Fertilizer Application Rates in Africa

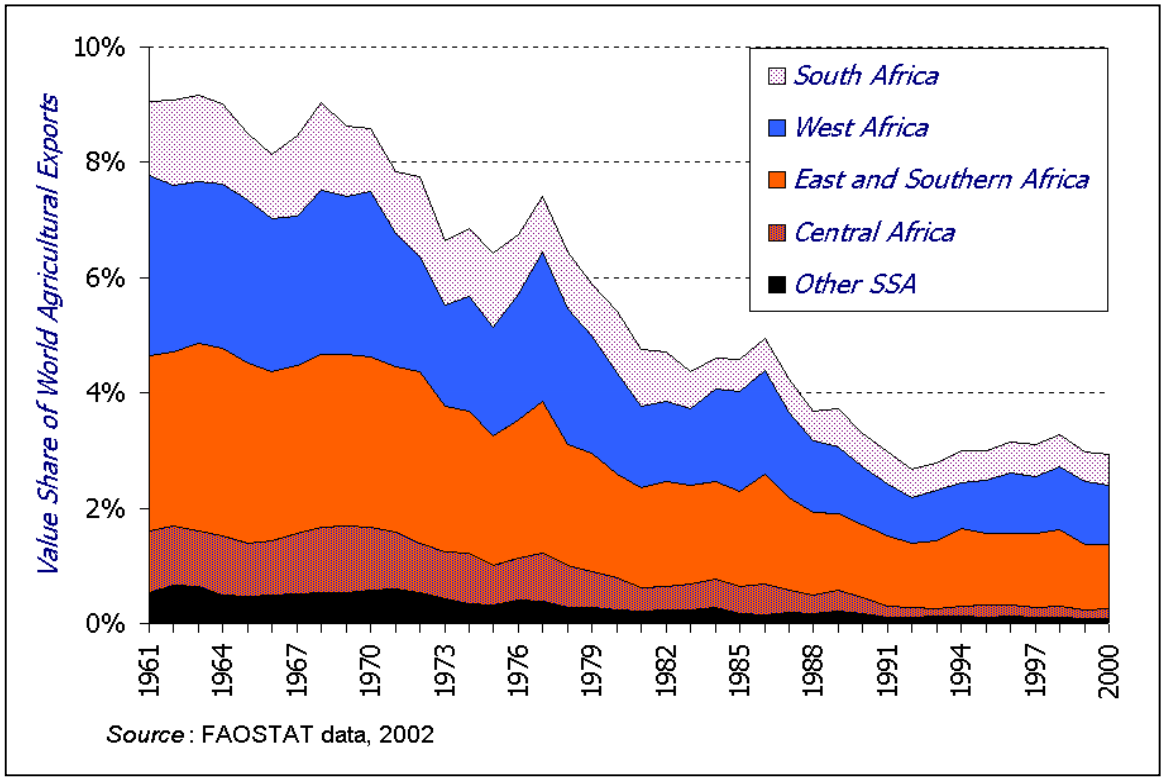

Figure 7 Africa's share of the world's value of agricultural exports (1961-2000)

Part of the problem is that Africa is an extremely diverse sub-continent, both in terms of physical geography and remoteness, natural resource endowments, colonial heritage, language and culture, political economies, and thus opportunities for growth and development vary from country to country, and even within a country's borders. Such diversity in local conditions makes it that much more challenging in getting agriculture to move on a grand enough scale to affect continent-wide growth. And as the evidence shows, this has yet to happen. Agriculture has just not grown rapidly enough to stimulate the economic growth rates necessary to lift the bulk of rural populations out of poverty, nor to keep pace with their growing food needs.

As this paper will show, the opportunities to raise productivity and growth do exist, however. What is needed is the commitment of African leadership and donors to generate the necessary resources, and design clear policies, programs and strategies, through strong partnerships and alliances, to get agriculture moving again in Africa.

Future Scenarios

What are realistic scenarios for the future of Africa and African agriculture? IFPRI has addressed this question using its global food model, IMPACT (see Rosegrant et al. 2001). Three scenarios for Africa were projected to 2015. The first is a baseline

scenario that assumes "business as usual" in terms of levels of investment in people and rural areas, population growth, and key economic policies. This is contrasted with optimistic and pessimistic scenarios.

The pessimistic scenario assumes greater complacency about agriculture with sufficient decline in public investment and policy reform to allow yield growth rates to slip by 50% for crops and 30% for livestock. Because of the importance of agriculture in national economies, this pessimistic scenario for agriculture is accompanied by a 50% decline in GDP growth. The optimistic scenario assumes a modest increase in public investment and a greater commitment to policy reform. Crop and livestock yield growth rises to between 3 and 4% per year, and GDP growth in some sub-regions reaches 8 percent.

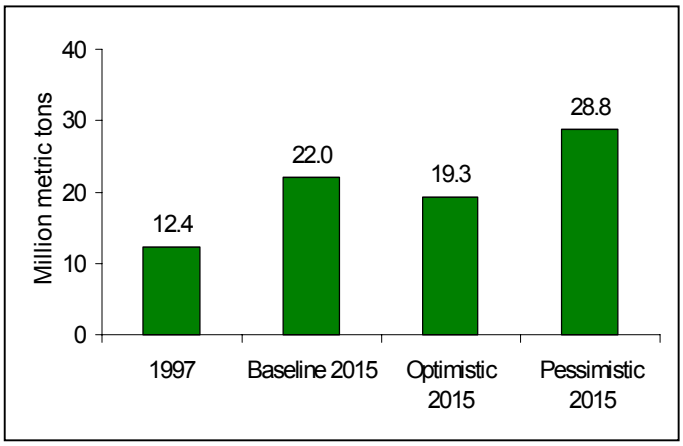

Figure 8: *Net Cereal Imports*
Projected alternative scenarios for Africa
Source: IMPACT model simulations, IFPRI 2002

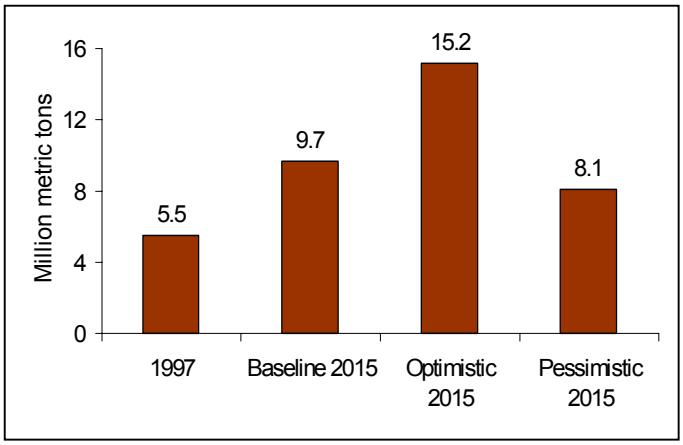

Figure 9: *Meat Demand*
Projected alternative scenarios for Africa
Source: IMPACT model simulations, IFPRI 2002

Under the baseline scenario, Africa's demand for cereals and roots and tubers will virtually double by 2015. Most of the needed supply can be produced within Africa under the baseline scenario through 50% increases in crop yields and a modest expansion in the cropped area. Africa would remain self-sufficient in roots and tubers but would need to increase cereal imports from 12.4 mt in 1997 to 22 mt in 2015 (Figure 8). Meat demand will almost double, from 5.5 mt in 1997 to 9.7 mt in 2015 (Figure 9). Again, Africa has the capacity to meet most of this increase from domestic production under the baseline scenario.

Per capita incomes will increase by about 22% in the baseline case (Figure 10 below), and per capita consumption of calories would increase 6.9% to 2387 Kcals per day (Figure 11 below). The number of malnourished children would increase, from 32.7 million in 1997 to 37.9 million in 2015 (Figure 12 below). But given a

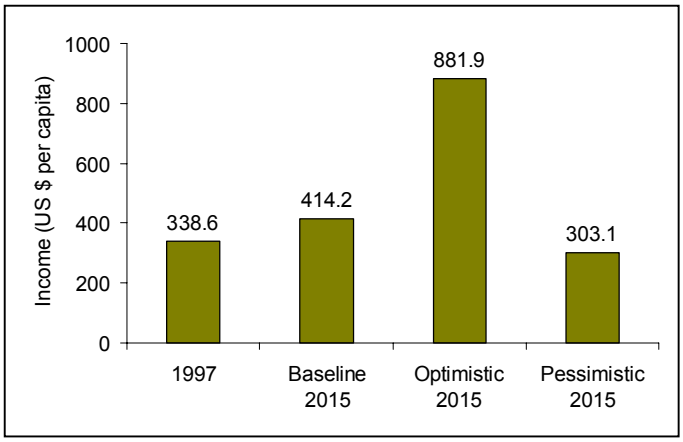

Figure 10: *Per Capita Income*
Projected alternative scenarios for Africa
Source: IMPACT model simulations, IFPRI 2002

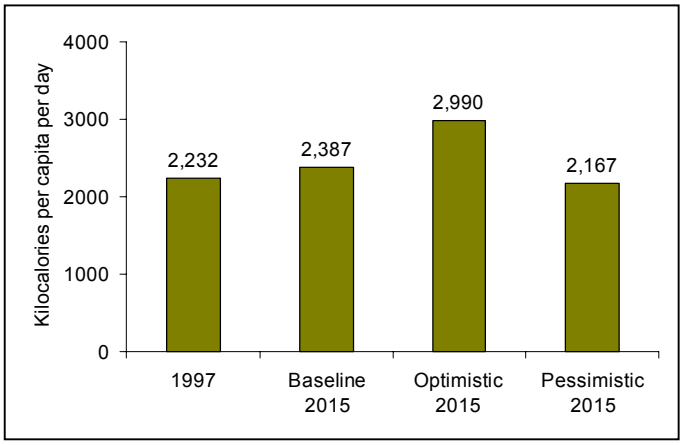

Figure 11: *Per Capita Daily Caloric Demand*
Projected alternative scenarios for Africa
Source: IMPACT model simulations, IFPRI 2002

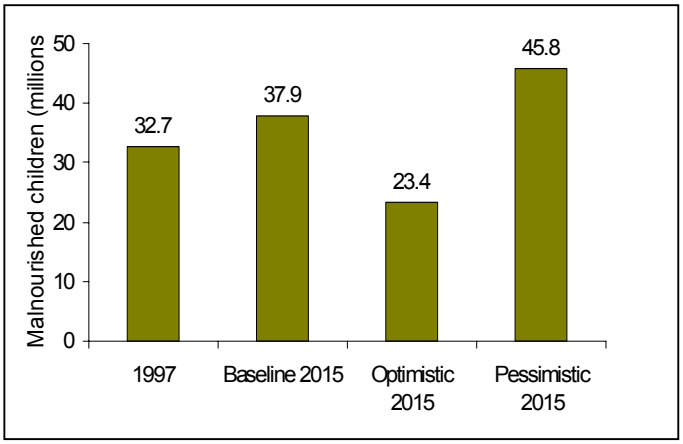

Figure 12: *Numbers of undernourished children*
Projected alternative scenarios for Africa
Source: IMPACT model simulations, IFPRI 2002

population growth rate of about 2.5%, the proportion of children undernourished would actually decrease to about 25% by 2015 from a high of 33% in 1997.

If policy makers become more complacent about agriculture, then things will get much worse. Growth in demand for cereals, roots and tubers, and meat will rise more slowly than population growth, and the per capita consumption of calories will fall from 2232 K cals per day in 1997 to 2167 K calories per day by 2015. Per capita incomes will decline by 11%, the incidence of child malnutrition will remain unchanged at about 30%, while the numbers of children affected reaches 45.8 million by 2015, up by 13 million children compared to the baseline scenario. Even with these lower levels of food consumption, Africa would have to import significantly larger amounts of cereal and roots and tubers by 2015.

However, if policy makers commit to the relatively modest agricultural growth agenda assumed in the optimistic scenario, then things can be turned around. Demand for cereals and roots and tubers would rise 20-30% more than in the baseline by 2015, and meat consumption would increase another 56%. Per capita consumption of calories would rise to 2990 K cals per day, child malnutrition would be slashed to 23.4 million (a 40% reduction

below the 37.9 million projected in the baseline for 2020, and about half as many as would arise under the pessimistic scenario). Per capita incomes would be nearly three times larger than in the baseline and 2.6 times larger than in 1997. Most of the additional food would be produced within Africa through higher yield growth, and total food imports in 2020 would actually be less than under the baseline scenario.

Costs to Reduce Hunger

These simulations confirm that if policy makers commit to an agricultural growth agenda, then it is possible to make serious inroads into poverty and food insecurity in Africa, and to reduce child malnutrition by at least 40% in 2015 compared to what it may otherwise be. This agenda will require more investment, and the IMPACT model provides estimates of the total amounts needed between 1997 and 2015 (Table 1).

Table 1 Invested Requirements for Baseline and Optimistic Scenarios, Africa, 1997-2015 (million US$)

Investment Sector	Baseline Scenario	Optimistic Scenario	Increase over Baseline
Agriculture*	$54,897	$94,301	$39,404
Education	$9,818	$26,604	$16,787
Access to Clean Water	$13,675	$17,027	$3,352
Total Investments	$78,389	$137,932	$59,543

Notes: * Agricultural investments are defined broadly here to include research and development (R&D), irrigation, and rural infrastructure (roads).
Source: IMPACT model simulations, IFPRI, March 2002

Under the baseline scenario, the total investment cost over this period in agriculture and rural development is $78.4 billion. This will need to increase to $137.9 billion to achieve the optimistic scenario, an increase of $59.5 billion over the period 1997 to 2015, or $3.3 billion more per year. Since no additional investment had been forthcoming by mid-2002, then either the optimistic targets for 2015 must be postponed, or the annual rate of investment between 2002 and 2015 will have to be increased to about $5 billion per year.

Two thirds of the additional investment funds are required for direct investment in agriculture (split roughly as 50% for rural roads, 35% for irrigation, and 15% for agricultural research and extension), while 30% are required for education and 5% for clean water.

Altogether, the additional $5 billion per year required under the optimistic scenario is not a huge amount and part of it would even come from farmers themselves (e.g. small scale irrigation, land improvements, etc.).[1] It compares, for example, with the weekly cost of the agricultural protection policies of the OECD countries (OECD, 2001).

[1] A farmer's own modest investments in improved technologies have been shown to result in high returns if markets are there to absorb any excess supply.

III. Lessons Learned and a Rebirth of Optimism for Growth

The projections in the previous section suggest that an agricultural-led transformation of Africa is both technically and economically feasible. Yet many policy makers and donors remain skeptical about the realism of achieving this vision. Already, many billions of dollars have been invested in agricultural development in Africa over the past 30-40 years, yet there seems to be little to show for that investment when judged by the low and stagnant levels of productivity observed today. Any attempt to revitalize investment in African agriculture must provide convincing answers to the following key questions: What has been learnt from the past? What will be different today? How can we be sure that it will work?

There are three parts to the answer to this challenge. First, much has been learnt from past experience, and there is a much better understanding today of what needs to be done and how. Second, things are different today and there are many new opportunities for Africa to seize that did not exist until recently. Third, modern information systems and enhanced national capacities for policy research and analysis permit the establishment of cost-effective monitoring and evaluation systems to track progress and provide feed back so that national investment strategies can not only be developed but then subsequently adapted and modified as needed on a timely and effective basis. In short, there is now growing capacity to put in place processes of change rather than just a plan of change. We discuss each of these issues below.

Learning from Africa's Development Experience

Much has been learnt in recent years from past mistakes and successes in African agriculture, particularly about appropriate polices and investments and ways of implementing and managing development.

A Brief history

Although Africa is a highly heterogeneous continent, there has nevertheless been considerable uniformity amongst countries in their approaches to agricultural development and the outcomes of those strategies. From independence until the 1980s, attempts to develop agriculture focused largely on the production of traditional export crops and were undertaken within a policy context in which agriculture labored under adverse terms of trade and an inordinate amount of government intervention.

Driven by a desire to industrialize, primarily through import substitution, national policy makers sought to use agriculture as a cash cow to generate the foreign exchange, cheap food (hence low wages) and investment capital needed for industry. The domestic terms of trade were turned against agriculture through domestic pricing policies and overvalued currencies and agricultural exports were taxed heavily. To increase production while penalizing farm gate prices, governments intervened heavily in most aspects of agricultural production and trade, converting the agricultural marketing boards

that they had inherited from colonial days into powerful and monopolistic parastatals. Many countries also gave priority to commercial farming in allocating their public investments, R&D and subsidized inputs, particularly where white settlers or socialist cooperatives were concerned.[2] This general development paradigm was widely supported by the donors who were instrumental in financing many of the state bureaucracies and their investment programs.

Agricultural growth was tepid during this era. Agricultural export earnings remained high until world prices collapsed after the 1973 oil crisis, and has since only recovered marginally relative to South Asia for instance (Figure 13). Food production lagged population growth and food gaps began to emerge (Figure 14 below), requiring the first significant amounts of food aid.

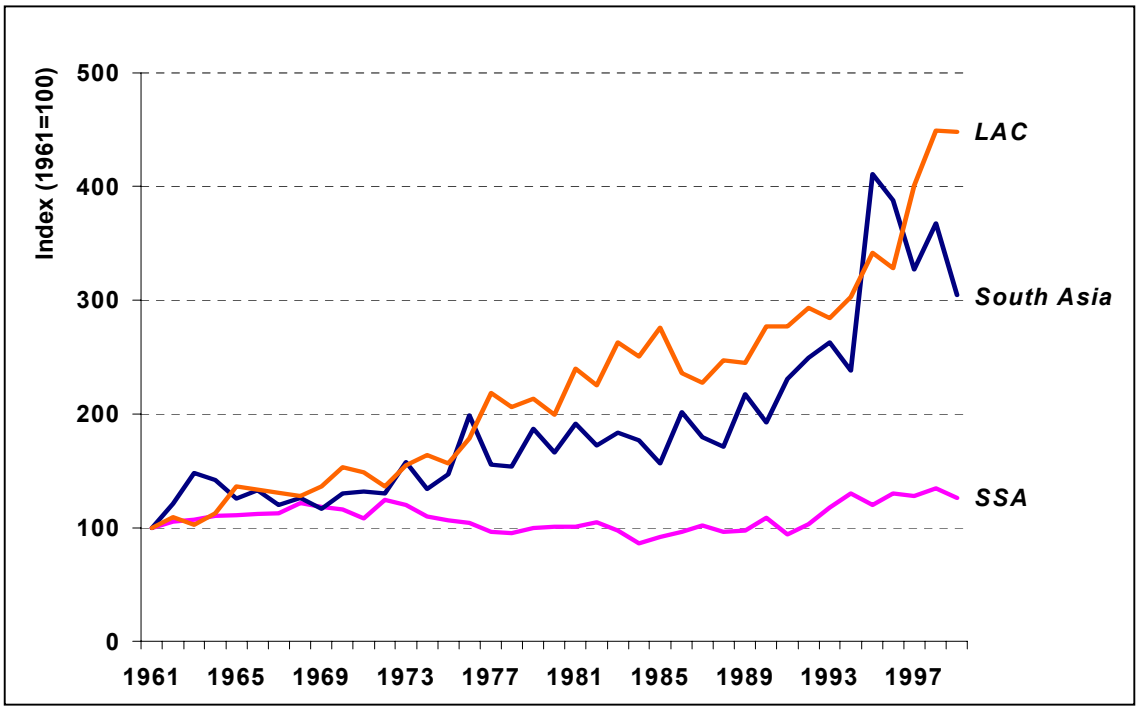

Figure 13: 40 year trend in Sub-Saharan Africa's Export Earnings (values calculated at base period price 1989-91). *Data source*: FAOSTAT, 2002

Rural poverty also widened, particularly in the many areas that did not grow export crops. As government revenues from agriculture fell, fiscal deficits began to burgeon. The maintenance of over-valued exchange rates exacerbated the problem for most countries, as did the rising cost of corrupt and inefficient state-owned enterprises

[2] In former settler colonies like Zimbabwe, Kenya and Zambia, a principal objective at independence was to extend support to smallholder agriculture, primarily to reverse the many years of a bias against African agriculture in favor of European commercial farmers under colonial or white minority rule. As a result, these countries actually experience periods of food production booms between the 1970s and 1990s (see Zimbabwe's example in Box 1).

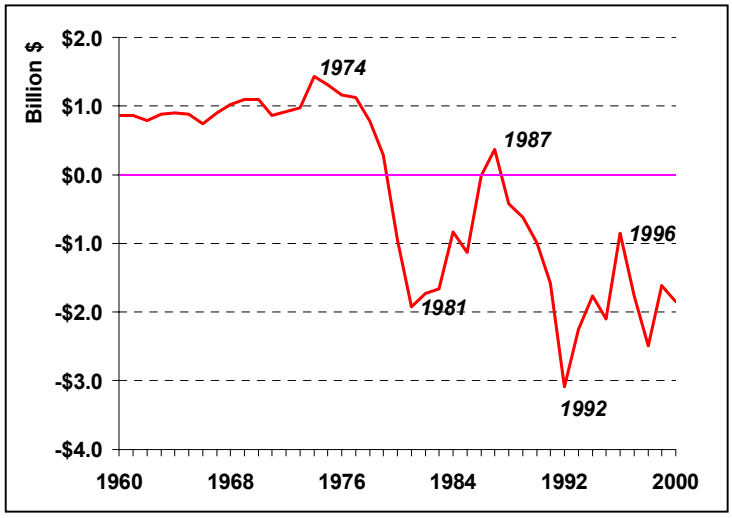

Figure 14: 40 year trend in Sub-Saharan Africa's Food Balance Sheet (calculated as value of food exports minus food imports).
Data source: FAOSTAT, 2002

and agricultural parastatals (Kherallah et al. 2002). To cover the deficits, governments resorted to printing additional money and/or borrowing cheap petrol-dollars on world markets, resulting in excessive debt accumulation and macroeconomic imbalances.

Even as these problems unfolded, many donors shifted their agricultural assistance towards rural development projects designed to assist poor farmers. The 1970s became the age of community and integrated rural development projects, with their top-down, state-managed emphasis on comprehensive area planning and development. Although inputs were heavily subsidized in most of these projects, and special R&D, input supply and marketing structures were often set up as part of the investment projects, there was little effort to redress the more general urban bias against agriculture and the unfavorable economic environment in which most farmers still labored. Many of these projects were not successful, particularly when judged by their ability to sustain development after the initial investment finds had been spent. But they added to the growing cost of bloated public institutions and subsidies and to the growing debt problem.

By the early 1980s it was clear that these development paradigms were not financially sustainable. Macroeconomic imbalances were widening but with little hope that world prices or agricultural growth would rebound and turn things around. At the same time, donors were also beginning to express their own doubts about the effectiveness of their development aid for African agriculture.

This led to a significant reorientation of priorities for both African governments and the donor community during the late 1980s and 1990s. For African governments, this was a time for adopting recommended structural adjustment packages, designed to stabilize their economies and create a free market environment conducive to private sector investments and employment growth. For many donors, the focus turned more explicitly to poverty and environmental issues, and to working less directly with governments and more with NGOs, community based organziations and the private sector. Donor support for African agriculture also began a precipitous decline.

Some key lessons

The early emphasis on traditional export crops sought to take advantage of Africa's natural comparative advantage in these crops, and the strategy was supported by public investments in infrastructure, technology, farm credit and input and marketing services in the regions where these crops were grown. In some countries, the marketing boards also did a credible job in enabling many smallholders to participate and benefit from export marketing. But the market distortions and heavy state interventions associated with the approach penalized agriculture more generally and discouraged private investment. A key lesson from this era is that agricultural growth requires an enabling economic environment. One of the primary objectives of SAPs and their related agricultural sector adjustments was to help create that enabling environment.

But the subsequent experience with SAPs shows that simply getting price policies right is not enough. There is also a complementary need for sustained public investment in the supply-side of agriculture, without which there is little aggregate supply response. Lessons from Zimbabwe's smallholder maize revolution are particularly noteworthy (Box 1).

Box 1 A smallholder green revolution in Zimbabwe (1980-86)

At independence and throughout the 1980s, Zimbabwe experienced a smallholder green revolution in maize and sorghum production. Yields more than doubled and led to a food production boom that was primary led by the smallholder sector. Adoption of improved varieties during this time was among the highest in Africa, reaching close to 95%. A key determinant of the boom was the heavy government investments in physical infrastructure (roads and storage facilities) and input support services. As a major staple in the region, the inevitable decline in maize prices benefited consumers immensely, indirectly reducing poverty. Unfortunately, an overextended government bureaucracy, together with misaligned policies, made the system financially unsustainable in the long run. Nevertheless, a key lesson from Zimbabwe's experience is that a green revolution can occur in Africa if smallholder farmers face the right incentives.

Source: Mosley (forthcoming). Other helpful sources on Zimbabwe's experience, as well as the more general experience of maize in Africa, are Byerlee and Eicher (1997).

Unfortunately, the need for fiscal retrenchment under SAPs led to savage cuts in public investment in agriculture, and which were not offset by any increases in donor investment. For instance, from 1990 to 1998, public investments in agriculture accounted for less than 2% of total GDP in many African countries, while donors allotted less that 20% of total development assistance to agriculture. This cut back on already existing low levels of investment in rural infrastructure has left Africa with a level of infrastructure development today that is only a fraction of what Asia had decades ago (Spencer, 1994).

The abrupt withdrawal of the state parastatals and of subsidized inputs also left a vacuum in many agricultural marketing and input supply services that the private sector has not yet been able to fill, especially in regions more removed from roads and markets

(Kydd, 2002). A similar outcome has arisen with credit. The liberalization of rural financial markets and the removal of public agricultural development banks and their lines of subsidized credit has also left most smallholder farms without adequate access to agricultural credit. Partly as a result of these shortcomings, there is little evidence that the SAPs have led to any sustained increase in aggregate agricultural supply (World Bank 1994; Kherallah 2002).

Another important lesson is that there is still a key but different role for the public sector to play in the provision of marketing and agricultural input services. If farmers are to benefit from the market reforms, then they will need to see improved access to markets and lower marketing costs. The weakness of rural markets is partly a problem of poor infrastructure, particularly roads and communications systems, but problems with quality standards, timing, market information and assured supplies are also penalizing local products in both domestic and international markets. The private sector could play a larger role if it were not also constained by some of these same factors, as well as by weak legal and financial institutions. These constraints provide a rich and legitimate agenda for the public sector to address, but one using policy to promote private sector activity rather than supplying marketing and input supply services itself.

One of the more successful outcomes in recent decades has been the role of agricultural research in generating technological change. Higher yielding and more drought and pest resistant varieties helped increase food supplies, even if not at a sufficient rate to keep up with population growth. Early attempts to create an Asian-style Green Revolution in Africa proved misguided, because their heavy emphasis on irrigation and high levels of fertilizer and other modern inputs were not compatible with the high cost and difficulty of delivering these inputs in Africa under prevailing levels of infrastructure and market and institutional development. Greater success was achieved when the focus moved in the 1980s to Africa's staple foods like maize, cassava, yams, millets and sorghums grown within existing low-input farming systems (see Evenson and Gollin 2001; Masters et al. 1998; and Oehmke and Crawford 1996). Many of these successes are well documented and reviewed in Chapter IV.

Despite these successes, many national R&D systems are still poorly positioned to address the important natural resource management problems that now confront African farmers (e.g. low soil fertility) or to improve the lot of poor farmers constrained by complex and low-productivity farming systems in risk-prone environments. R&D for traditional export crops has also failed to raise productivity growth in recent decades, contributing to a loss of competitiveness in world markets and a decline in market shares.

Donor assistance has had less impact than it might because it has been driven more by competing and often changing agendas with inadequate support for supply-side fundamentals like rural infrastructure and human capital. This has also led to some diffusion and weakening of the development efforts of African countries themselves, unable to successfully resist donor pressures (Lele, 1992). Donor support for agricultural development also fell at a crucial time when new investments were most needed. Real per capita aid levels declined by one-third between 1990 and 1998, and assistance for rural

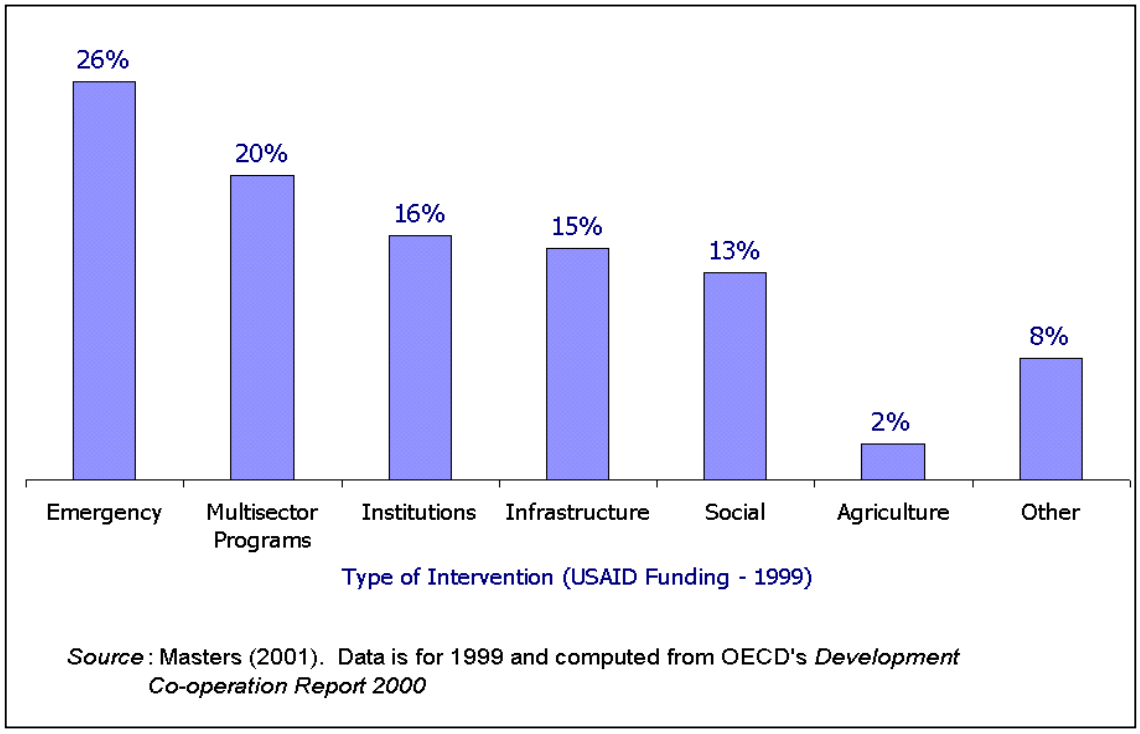

Figure 15 Total U.S. Official development Assistance by Sector

development and agriculture fell even more sharply (Wolgin 2001). As recently as 1999, African agriculture received less U.S. development assistance than any other sector (Figure 15).

The World Bank's lending for agricultural activities also declined dramatically between 1980 and 2000, from about 31% in 1979-81 to less than 10% in 1999-00 (World Bank). African governments did not fare any better and have allowed investment levels to stagnant over time. As a share of total government expenditures, African agriculture in 1998 was still well behind Asian agriculture – 5% compared to 10% for Asia (Fan and Rao, 2002). The situation has not changed much over time. In fact, spending on agricultural R&D per agricultural worker actually declined in Africa between 1976 and 1995, while it increased elsewhere (Figure 10) – resulting in an overall decline in morale among many NARIs (Pardey, Roseboom, and Beintema 1995). With most governments facing tight controls on fiscal spending, a 5% share for agriculture is grossly inadequate.

A recent FAO study shows a dramatic decline in the allocation of resources to agriculture among countries with a high incidence of malnutrition (a majority of them in Africa), from about 7% between 1990-93 to 5% in the period 1996-99 (FAO, 2001)[3]. It seems possible that donors will be willing to work more collectively in the future, guided

[3] From Table 3.8 in World Food Summit: Five Years later (2001), FAO, Rome. The document can be downloaded at http://www.fao.org/worldfoodsummit/english/background-e.pdf

by recent internationally agreed goals and agendas (e.g. the Millennium goal of cutting hunger in half by 2015) and the poverty reduction strategies of individual countries.

Past experience has also shown that Africa's heavy dependence on a few traditional agricultural export crops renders it vulnerable to downturns in world prices. More generally, Africa's terms of trade for agriculture have also been depressed by the protectionist agricultural policies of many OECD countries. These policies saturate OECD food markets with heavily subsidized food from domestic sources, and then export subsidies are used to dump part of the surpluses in world and developing country markets, where they depress the prices that developing country farmers receive. Despite short-term benefits to African consumers, the net cost of these policies in lost trade for Africa is about $4-5 billion per year (Rosegrant, personal communication), and this does not consider the longer-term benefits of trade induced improvements in technology and economic efficiency or the limitations these policies impose on the potential to use agriculture more aggressively as an engine of pro-poor growth for Africa.

Experience shows that good policies and investments can go sour not because they are poorly conceived, but because the institutions that implement them do not work well. The reform of public institutions must overcome vested interests, otherwise new forms of intervention and rent seeking simply replace old. Drastic reengineering is often required. Devolution of relief efforts to civil society has avoided many of the bottlenecks that plague public distribution. But relief has become more independent of government development efforts, exacerbating long term dependence on assistance and reducing the amount of resources available for development. The cost of disaster assistance is becoming a major financial burden for many governments and donors, and the cost is escalating as more people live in vulnerable areas and as global climate change increases the frequency and severity of many natural disasters.

Nor do top-down, state-run interventions work for development in Africa. More promising results for growth and poverty alleviation have been obtained by engaging the private sector, NGOs and community-based organizations in more participatory and demand-led interventions. But in their enthusiasm to embrace new types of agents and approaches, donors have been negligent in failing to strengthen public institutions so that they can play their properly defined roles. There are still important public goods and services that can only be provided or regulated by the public sector, yet many public institutions are poorly positioned to play these roles. A good example arises in agricultural marketing. While direct government provision of agricultural marketing services through parastatals has rightly been dismantled, too little effort has been made to build up effective public institutions that can establish and regulate food safety and product quality standards, provide market information, regulate and enforce contracts between private agents. Yet without these public services, the private sector has limited capacity to thrive.

Population growth rates in Africa have continued to be among the highest in the world, putting pressure on the ability of many countries to feed their populations. High population growth has meant that even the successes that were achieved in agricultural

productivity growth did not translate into per capita improvements in incomes and food availability. Rapid population growth has also been accompanied by the spread of human diseases like Malaria and HIV/AIDS which are taking a tremendous toll on public social services, labor productivity and household savings. Increasingly, scarce resources are being diverted away from investing in economic growth and development to dealing with growing disease problems. HIV/AIDS has been estimated to reduce per capita economic growth by as much as half a percent per year. Already 7 million people have died in Africa since 1985 as a result of HIV/AIDS. Another 16 million are projected to die by 2020, as affecting over 25% of the labor force in worst affected countries (FAO, 2001). A clear lesson is that population policy and the containment of infectious diseases must be part and parcel of any successful agricultural development strategy. Agricultural development can provide the resources for rural people to improve their health; at the same time improvements in the health of rural people increase their productivity and the prospects for successful agricultural intensification.

Much the same goes for civil conflict. Poverty and environmental degradation contribute to civil conflict, which has now become a major factor contributing to the high incidences of hunger and poverty on the continent. Besides displacing millions of people, it has disrupted efforts to reach the very poor and vulnerable populations (Messer, Cohen and Marchione 2002). The cost of civil conflicts to human welfare and development is immense, and feeds further conflict as food becomes increasingly scarce. Integration of agricultural development objectives into conflict resolution and recovery programs will be essential.

The 1990s also brought more emphasis on gender issues, recognizing that investing in women's welfare is a 'win-win' strategy. Women in rural Africa are farmers, entrepreneurs, and nutritionists (being responsible for managing the daily nutritional intake of their households). Most rural women not only have to produce, harvest and process food staples (such that they provide over 70% of the total agricultural labor force), they also have to prepare meals and look after the welfare of their children, the sick and the elderly. Yet, in spite of their key roles in the food production systems, development priorities have too often been biased against them. They have often faced fewer opportunities to access to: modern inputs, especially labor saving technologies that can ease periodic bottlenecks; land ownership; information and extension services; primary education; etc.

Given these constraints, some studies have concluded that if women had equal access to modern inputs for instance, food production in Africa could easily increase by as much as 15% (Saito et al. 1994). Meanwhile, providing access to education and food production inputs has also been to shown to have a direct impact on reducing malnutrition among children under 5 years of age (Smith and Haddad, 2000). Therefore, if a strategy to reduce child malnutrition is to be successful, gender biases will need to be seriously addressed.

Implications

It is now widely agreed that agricultural growth offers the only viable pathway for achieving higher living standards and poverty reduction on the scale required for most of Africa by 2015. But this brief overview of past experience has highlighted the need for a different approach; one that simultaneously addresses in an integrated way the pressing social and environmental problems facing Africa as it enters the 21st Century. There is now a growing consensus that the new approach must be less dependent on government direct intervention but rather based on participatory development approaches, civil society, market forces and key partnerships between stakeholders.

Under the new approach, governments are expected to focus on creating an enabling environment in which other agents can operate efficiently, and to refrain from undertaking activities that others can do better. This entails creating the right kind of economic incentives through national and regional economic policies, establishing conducive legal, governance and institutional arrangements (including decentralization), and partnering with other stakeholders in providing public goods, environmental supervision and targeted assistance for the poor. Within this enabling environment, NGOs, CBOs, and some private agents and specialized government agencies can then focus their efforts and work together in supporting community development activities and assisting disadvantaged groups gain greater access to resources and markets. Taken together, these interventions are expected to provide the enabling and empowering environment in which local people and private firms can best pursue improvements in their own livelihoods and quality of life, in full cognizance of the particular opportunities and constraints that they face.

New and Emerging Opportunities

The emerging consensus about how best to approach agricultural development in Africa is buoyed by existing and new opportunities for agricultural growth in Africa. The continent is still blessed with abundant natural resources on a per capita basis, which provide an important source of as-yet untapped growth potential. For example, Africa has twelve times the land area of India but only half as many people to feed. And despite the devastating impact of HIV/AIDS, Africa's has a growing rural labor force that remains underutilized. Rural population growth in Africa is projected to grow rapidly (Figure 16), and this should help induce a continent-wide shift towards more labor intensive and higher yielding farming systems, much as population growth did in Asia.

Yields are currently so low in Africa that there are lots of opportunities of raising them through technological change (Figure 17). There is considerable scope to apply already available technologies (off-the-shelf) if conditions for more widespread adoption can be improved. The application of conventional plant breeding and NRM research can raise yields even further. And there are also many opportunities for research to help

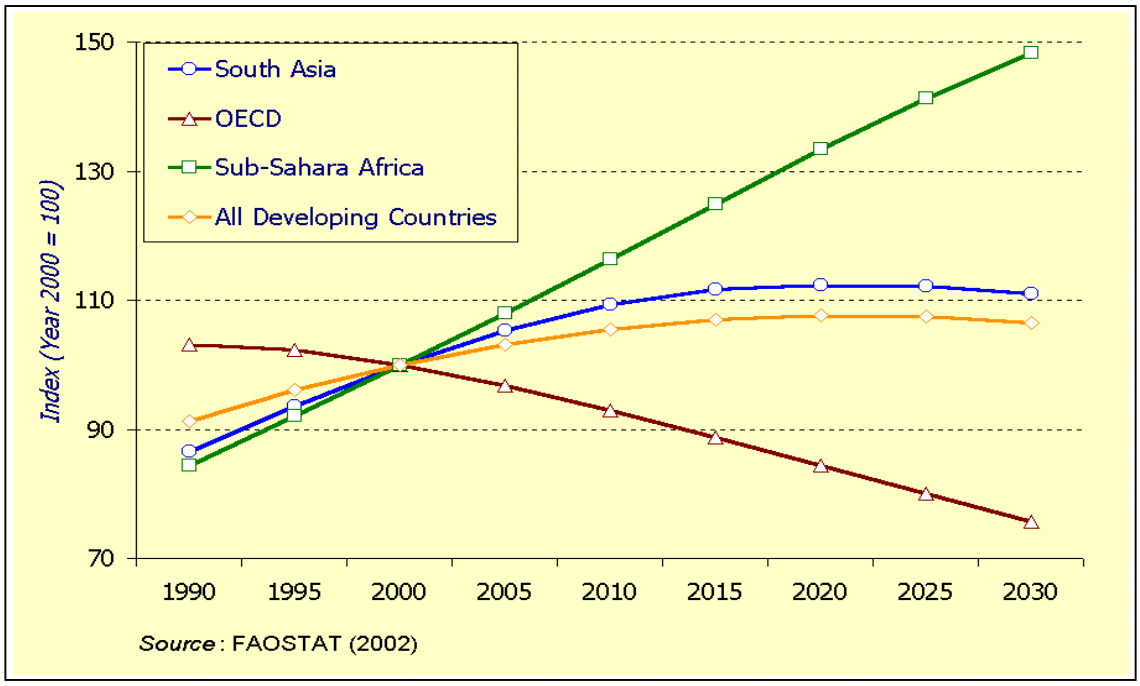

Figure 16 Rural Population Growth Projections (1990-2030)

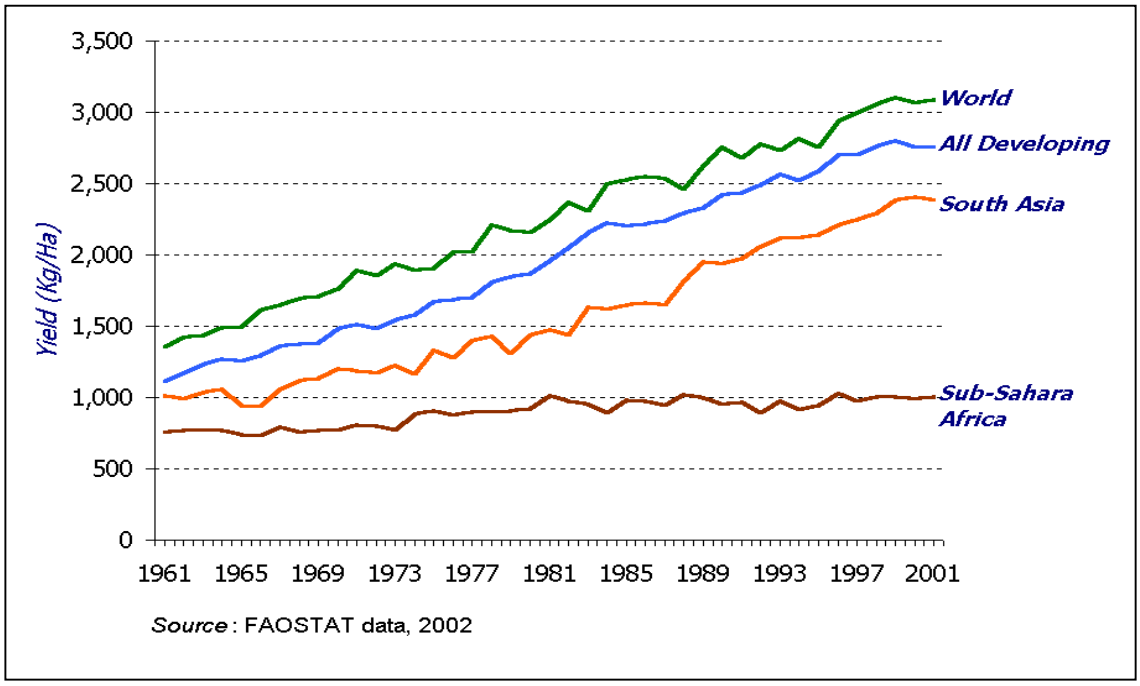

Figure 17 World's Cereal Yield Trends (1961-2001)

reduce post-harvest losses (processing and storage technologies). Properly tapped, biotechnology also offers considerable long-term potential to address many of Africa's challenging production and environmental problems, and to ensure sustained increases in productivity over time.

The revolution in communications and information technologies offers exciting new opportunities. Through rapid and timely exchange of knowledge and information, it accelerates the process and quality of technology generation. It facilitates timely up-to-date market information to those who need it most – farmers and entrepreneurs and it accelerates the process of relevant and appropriate technology transfer. Access to better market information via the Internet will enable African exporters to participate more effectively in world markets and help reduce entrepreneurial risk related to business transactions.

Globalization is bringing new market opportunities. World markets are far more integrated today than ever before and the volume of world agricultural trade has more than doubled since 1981, as illustrated in Chapter II (Figure 7). So far, Africa has lagged behind the rest of the world; its share of agricultural trade fell from a high of 8% in the 1960s to about 3% by 2001 (FAOSTAT data, 2002). Given its natural comparative advantage in producing many export crops, Africa should, with the right mix of domestic market reforms and institutional and infrastructure investments, be able to reclaim larger market shares.

Not only has the world changed dramatically over the last decade, Africa has also changed. In the aftermath of structural adjustment programs to remove costly public support services, various African governments have been experimenting with new institutional innovations built around private/public partnerships to help fill the void. For example, they have worked on creating mechanisms for sustainable financing of R&D and agricultural extension. Governments are also increasingly decentralizing authority to the local level, allowing rural communities to influence decisions that are relevant to their needs. Many African countries are also instituting democratic principles of governance, and committing themselves to reducing hunger and poverty. They are well on their way to creating the type of enabling environment necessary for nurturing a dynamic business and private sector.

For the first time since independence, development solutions are increasingly being sought from a sub-regional perspective (East, West, Central and Southern Africa). There are now many more sub-regional trade agreements, organizations and networks addressing various development issues relevant to an entire sub-region or region, especially in terms of agricultural R&D, product grades and standards, harmonization of trade and market policies, etc. (Box 1). This change of attitude has opened the door for many more countries to benefit from greater economic integration and to capture spillover benefits from the exchange of technology and information.

Many African countries are now more firmly committed to reducing hunger and poverty than at any other time in the past. Some countries are providing clear blueprints

on how they will go about tackling hunger and poverty, by successfully integrating past macroeconomic and market reform efforts with more recent poverty reduction strategies (a good example is Uganda's 1997 Poverty Eradication Action Plan and its Agricultural Modernization Plan). Probably the single most important African-based Initiative today is the New Partnership for Africa's Development (NEPAD). Its importance is partly because it is one of a kind that has emerged as a joint statement and plan of action by Africa leaders to achieve economic growth and development. It can also be seen as a major cornerstone in showing Africa's renewed countrywide commitment and desire for ownership of future development priorities. The success of NEPAD will in part depend on the continued commitment of African leaders to cooperate in finding concrete solutions at regional levels (Berthelemy et al. 2002).

Many international donor communities have also committed themselves to ensuring that hunger and poverty are drastically reduced. Of particular relevance for agriculture is the 1996 World Food Summit goal of cutting hunger in half by 2015. Among many other donors, the United States has also committed itself to achieving this goal. The donor community is also supporting debt relief for Africa, as evidenced by the World Bank's Highly Indebted Poor Countries (HIPC) Initiative. HIPC is linked to the Poverty Reduction Strategy Process (PRSP) being undertaken in various African countries and will inevitably provide additional resources for investing in rural areas where a majority of the poor live.

Non-governmental organizations and partnerships are also renewing their efforts. For example, the recent formation in the U.S. of a Partnership to Cut Hunger and Poverty in Africa is helping to raise awareness of the need to reverse the deteriorating social and economic conditions in Africa, and their devastating impact on hunger and poverty, especially among children. There has also been explosive growth in the last decade or so in the presence of action-oriented NGOs in Africa, and they are now playing important roles in providing targeted assistance to the poor, in promoting improved technologies and approaches for managing natural resources, in providing microfinance services, amongst other things.

Monitoring and Evaluation Systems

Although we know much more about how to develop African agriculture today, there is no single one-size-fits-all strategy. There are certainly many common fundamentals (or pillars) that are shared across countries and regions in Africa, but nevertheless, each country and sub-region (East, West and Southern) will need to tailor their own national and regional plans to local specific conditions. To ensure success, development strategies needs to set in place a dynamic planning and learning process, strengthening both country and donor capacity for this type of work in the process. This will require rigorous data collection, analysis and planning; effective monitoring and evaluation (M&E) systems; and a capacity to revise and adapt plans over time.

The possibilities for such an informed approach to guiding development strategies are much greater today and are constantly improving. The evolution of modern information systems, computing power and scientific methods have opened up whole new opportunities for collecting and using information in intelligent and useful ways. For example, remote sensing by satellite and GIS techniques can be used to amass and analyze huge amounts of highly relevant data for agricultural planning purposes and to monitor changes in key land use and environmental indicators at low cost. Developments in household and community survey methods (including participatory research methods) and data processing have made these much more powerful and timely tools for planning and monitoring purposes.

The evolution of the Internet has accelerated the speed of communication and access to new knowledge and information systems from every corner of the globe. This means that many development solutions, lessons learned and best practices, are now readily accessible via the Internet. National capacities to undertake this kind of work have also improved and many countries already have rich data sets that are accessible. For example, several African countries have now completed several rounds of Living Standard Measurement Surveys, and hence have valuable panel data sets for nationally representative household samples. The key challenge is to find institutional mechanism through which these new resources can be harnessed and better linked to the work of planners within key government and donor agencies.

IV. Strategic Options for Accelerating Smallholder-led Growth

What are the basic elements of a strategy for moving African agriculture forward in ways to halve hunger by 2015? Conditions in Africa are diverse and development strategies need to be country specific, building on national comparative advantage and adapted to local constraints and opportunities. Nevertheless, certain key elements to guide appropriate policy and investment strategies can be given.

Focus on Smallholder Agriculture: A 'Win-Win' Strategy

Solving the problem of hunger and poverty in rural Africa will require a smallholder oriented development strategy. As Delgado (1999) recently put it "the smallholder sector is simply too important to employment, human welfare, and political stability to be either ignored or treated as just another adjusting sector of a market economy" (p165). Broad-based agricultural growth centered on small farms could make deep inroads into poverty rates in Africa. In Asia, such growth reduced poverty rates by one half in 25 years despite the addition of one billion people (Rosegrant and Hazell, 2000).

Smallholder agriculture in Africa has been shown to be both privately profitable and socially efficient in the long run (Lele and Agarwal 1989; Lipton 1977). The efficiency of smallholder farmers has often been disguised by policy distortions in favor of large estate farms or plantations, such as those seen in Malawi, Zimbabwe and Kenya for instance. According to some of Lele and Agarwal's findings for Africa, the efficiency of large farms quickly eroded once smallholder farms were permitted access to the same support services as those available to large farms. With a majority of smallholders lacking access to modern inputs (seeds, fertilizer and credit) and markets, it is no wonder that many have resorted to subsistence agriculture.

Because small farms are efficient and comprise most of the rural poor in Africa, then agricultural growth led by small farms would be "win-win" for growth and poverty reduction. Small-farm led growth would also not only bring immediate income and food benefits to many rural families, but it would also help lower national food prices and have powerful multiplier effects on the rest of the economy which can lift many more poor people out of poverty. These benefits vary with the stage of economic development of a country, but can be expected to be particularly large in many of Africa's poor countries where agriculture accounts for the lion's share of national income, employment and export earnings. Under these conditions, even a modest growth rate for agriculture can have significant leverage on the national economy. Empirical studies confirm the importance of these indirect food price and non-farm economy effects in developing countries (For a useful review, see Haggblade, Hazell and Reardon, 2002). In Asia, studies show that each dollar of growth in agricultural income generates between $0.5 and $0.8 in the rural nonfarm income. These multipliers are about half as large in Africa (Haggblade and Hazell, 1989) except in remote regions where poor market access makes many staple foods into local nontradables (Delgado et al. 1998). The multipliers are also

larger when growth is concentrated among small and medium sized farms (Haggblade and Hazell 1989; Hazell and Roell 1983)

The poverty impacts have also been shown to be large. For example, In Asia, studies have shown that each 1% growth in agricultural productivity led to a 0.2 to 0.4% decline in the number of poor in Asia (Hazell, 2002). More recently for Africa, each 1% growth in agricultural productivity has been shown to reduce poverty by 0.6%, or put another way, a one percent increase in yields can reduce the number of people earning less than $1 per day by about six million (Thirtle et al., 2001). These results show that rapid and broad-based agricultural growth can lead to sizable reduction in poverty (and hunger) while serving as a major engine of economic growth.

Broad-based development strategies require that small and medium-sized farms receive priority attention in publicly funded agricultural research and extension, and that they obtain adequate access to markets, credit and input supplies. Because they have small volumes of products to trade, small-scale farmers face serious disadvantages in accessing markets on an equal footing to large-scale farms. For this reason, voluntary CBOs and cooperatives and vertical contracting arrangements within market chains have important roles to play in linking small-scale farmers to markets, especially for higher value products. These requirements demand special attention at a time when markets and agricultural services are being privatized, since the high transport costs and thin markets of many rural areas in Africa do not make them attractive to private agents.

Infrastructure and Rural Services

Infrastructure and rural services are central to agricultural development, and yet Africa's existing stock remains extremely low (see Box 2 below). Improved infrastructure and rural services not only expand opportunities for growth, but also help ensure that such growth is more diffused and equitable. Without the means to connect rural areas to market centers, farmers cannot procure sufficient fertilizers and other inputs at prices they can afford, nor can they market their own products effectively. In the absence of good infrastructure, market reforms can drive a greater wedge between those living in remote regions and those who are well connected by infrastructure, often with the former retreating into subsistence farming. Similarly, poor access to health and education services in rural areas diminish agricultural productivity, contribute to the spread of infectious diseases, discriminates against women and can lock rural people in a poverty trap.

Africa's low population densities make per capita investment and maintenance costs high and difficult to finance. Future strategies should focus on low cost alternatives, such as satellite communications, and wind and solar power. Even the costs of feeder roads could be contained by encouraging greater use of animals and bicycles for local transportation, while building roads to match. Past difficulties with the maintenance and upkeep of rural infrastructure need to be addressed through greater local ownership of investments and devolution of maintenance responsibility to communities and local government. Recent efforts to decentralize road rehabilitation and maintenance efforts in

Box 2 Africa's poor investments in rural infrastructure and services

Today, Africa has about one sixth of the road density that India had in the 1950s before its own green revolution and less than one third the irrigated area (Spencer, 1995). Perhaps as many as 70% of Africa's farmers are poorly connected to roads and markets, and hence face high transport costs as well as physical difficulties in accessing markets and public services. Few in rural areas have access to electricity (about 5%) and fewer still have access to a telephone, the lowest rates in the world. Enrollment rates in primary education have actually been on a decline in Africa over the past two decades (1980s and 90s), the only developing region to do so during this period (see Table).

Table Percent enrolled in Primary Education (1980-97)

	1980	1997
Latin America & Caribbean	105	113
Middle East & N. Africa	87	95
South Asia	77	100
Sub-Saharan Africa	81	78

Note: Net enrollment ratios exceeding 100 indicate discrepancies between estimates of school-age population and reported enrollment data (*source*: World Development Indicators, 2001)

Tanzania could be a useful model to follow (see Box 3). Local incentives can be enhanced by tying investments from central government to matching funds from local district level sources.

Achieving realistic levels of infrastructure and rural services will require substantial increases in public investment. Public investment in rural areas has fallen in many African countries in the past decade or so due to the fiscal pressures imposed on governments through SAPs and a precipitous decline in donor support for such fundamentals (Fan and Rao, 2002). The over zealous downsizing of the public

Box 3 Decentralizing the rehabilitating and maintenance of feeder roads in rural Tanzania

Up to 530 miles of rural roads have been rehabilitated in 23 districts, and 107 bridges constructed since 1998 under a USAID roads program in Tanzania. The impact on transportation costs has been reported to be quite significant in the target areas, reducing costs by about 40% on average. But most importantly, the program has successfully involved local district governments and the private sector in managing road maintenance and rehabilitation. Today, the level of private sector involvement now constitutes over 80 percent of the district roads rehabilitated and maintained under this program. For local districts, capacity building in the processes of bid preparation, tendering, award and supervision of road rehabilitation and maintenance contracts has also contributed to this success. Recent consultations with various academics, policy makers, and development practitioners in Tanzania applaud the program (Based on consultations conducted by Africa Bureau, March 2002).

Source: USAID/Tanzania's 2002 Annual Report and 2001 R4.

institutions that provide essential public goods and services like R&D, infrastructure, education and health will also need to be reversed. These institutions still have key roles to play and need to be revamped and strengthened to fulfill their functions in cost effective and demand responsive ways. In many cases there are useful opportunities to partner with private firms and NGOs in supplying these services (as will be pointed out later). For the public sector, it has a far more important role in regulating agricultural markets to ensure high standards, competition, food safety, and promoting exports and negotiating trade agreements. Unfortunately, with the demise of parastatal marketing agencies, many of these functions are not now being performed and there is an important vacuum that is hindering private sector development and more efficient markets (Kherallah et al. 2002).

In the absence of meaningful investments in human capital and infrastructure, there are very limited prospects for achieving the desired rates of agricultural growth and poverty reduction in Africa.

Science and Technology

Technological change in agriculture is essential for improving food security and agricultural growth, lowering food costs, and increasing competitiveness in domestic and foreign markets (in terms of both cost and quality of products). As shown in Chapter III (Figure 17), yields of major crops in Africa are currently low even compared to other developing country regions with similar agro-climatic conditions, and doubling or tripling yields should be quite feasible for many crops. Many technologies are already available "on the shelf" and could be more widely adopted if some of the enabling economic conditions were improved (e.g. better markets and infrastructure). But sustained productivity growth will require the development of a constant stream of new technologies, and this in turn will require more and better investments in R&D.

While some types of crop genetic research are vital for Africa (e.g. improving drought tolerance, yield response to scarce plant nutrients, food nutrient content, and pest and disease resistance), and have given some favorable returns in the past (see Box 4), there is a growing consensus that major productivity improvements in many rural areas will first have to come from improved natural resource management (NRM) practices and technologies and small-scale irrigation. NRM can lead the way in improving soil depth, organic matter, fertility and moisture content, expanding opportunities for higher yield response from fertilizers and improved crop varieties (Pretty et al. 1992; Uphoff 2002). Small-scale irrigation, including water capture at the micro-watershed level and the sustained development of some wetland areas could significantly raise productivity levels (Rosegrant and Perez 1997; Meinzen-Dick and Bakker 2000).

The high weather risks, uncertain markets, and poor infrastructure and market access that characterize many rural areas in Africa also make the use of high levels of external inputs unprofitable, placing a premium on regenerative or low external input (LEI) technologies. LEI technologies are typically labor intensive, both seasonally and in total, and this can be an important constraint on their uptake. Fallow and green manures

also keep land out of crop production and composting and manuring competes for scarce organic matter with household energy use, both of which are difficult for many small farms (Low 1993; Reardon 1995). The challenge is to develop LEI technologies that boost both labor and land productivity. Some good examples are conservation tillage and vegetative barriers to harvest water and contain soil erosion, and improved crop varieties that utilize scarce nutrients more efficiently.

NRM research should build on farmers' own indigenous knowledge and practical innovations. Some NGOs have been very successful in pursuing this agenda, and in working with local communities to overcome social and institutional constraints. The more effective linking of formal research to these kinds of grass roots development activities could also lead to real improvements in the relevance and uptake of much NRM research.

Box 4 Evidence of high payoff to R&D Investments in Africa

Public agricultural research investments in Africa have actually yielded high rates of return, similar to elsewhere in the world -- averaging in excess of 40% (Evenson and Gollin 2001; Alston at al. 2000; Masters et al. 1998; Oehmke and Crawford 1996;)*, and more than doubling the adoption rate of improved varieties between 1990 and 1998. Such rates of return are comparable to those obtained in other developing regions of the world (Masters, 2001; Thirtle et al., 2001). Broad cross-country successes have included maize in East and Southern Africa (Smale and Jayne, IFPRI working paper), rice in West Africa (Gabre-Madhin et al., IFPRI working paper), and Cassava in West Africa (Nweke 2002, IFPRI working paper).**

Notes:
* Some caution should be raised on interpreting these average rates of return, especially since a majority of the studies reviewed may have only represented successful impacts
** The IFPRI working papers referred to here are part of a series presented at the Lusaka Workshop on "Successes in African Agriculture", The Raj Pamodzi Hotel, June 10th-12th 2002

While improved technologies for food staples are much needed, sustained increases in small farm incomes will hinge critically on diversification into higher value agricultural products and non-farm activities. Additional research is required on livestock, agroforestry, aquaculture, horticultural crops, post-harvest losses and agroprocessing, many of which can prosper even in areas with poor soils and climate where some of the poorest farmers live.

But sustained growth in on-farm productivity will also require significant improvements in crop germplasm, and crop and livestock disease and pest control. Many opportunities remain for achieving these goals through conventional research techniques, but properly developed and used, biotechnology could be a powerful tool for accelerating progress and achieving higher and more stable yields within complex rainfed farming systems. Biotechnology offers particular promise for Africa in raising yield potentials; improving disease, pest and drought tolerance in many crops; disease control in livestock; reducing post-harvest losses; and enhancing the nutritional value of staple foods (Ives et al. 2001).

National Agricultural Research Institutions have been much maligned as being inefficient and out of touch, despite having provided similar high rates of return as elsewhere in the world (see Box 4). Nevertheless, there is still room for significant improvement as they turn to address the complex and challenging issues of the future.

Box 5 Reforms Needed in African NARIs

a) Development of agricultural science and technology policy frameworks that defines, among other things, goals, objectives, targets, incentives and commitments from government;
b) Institutional autonomy from public service for NARIs;
c) Increased reliance on user-based financing of some kinds of research to increase the sustainability and accountability to research users;
d) Forging, strengthening and institutionalizing linkages between researchers and research users in priority setting, conducting research and evaluating results, perhaps through established partnerships with farmers' organizations, trade associations and private firms;
e) Decentralizing NARIs and providing revenue retention authority to increase institutional autonomy and flexibility and spur competition among individual research units;
f) Providing management training and rewarding leadership and commitment to enhance the success of national agricultural research systems;
g) Comprehensive strategic plan to guide research and development efforts of NARIs;
h) Mechanisms established to coordinate across institutes and programs, to build linkages with SROs, regional networks and advanced research institutes; and
i) Mechanisms (e.g., business development unit) to operationalize private sector linkages

Source: Some of this comes out of the work done under the Sustainable Financing Initiative to strengthen African agricultural research – see for example Bingen and Brinkerhoff (2000)

The renewal and reform of research systems in Africa is critical to strengthen their capacity to undertake and deliver cost-effective and demand driven research. This will require giving farmer groups, including women farmers, more say in setting research agendas and in evaluating and disseminating research products, and changing funding methods (e.g. competitive research grants and user co-financing) to increase accountability, efficiency and transparency. Box 5 summarizes some of the reforms needed.

With growing capacity for research and extension in other agencies, such as universities, private-sector firms, and NGOs new partnerships between public R&D institutions can be forged to capture synergies and comparative advantages. For example, private seed companies and input suppliers are playing larger roles as many countries liberalize and privatize their agricultural input markets. Many of these companies not only develop improved products of their own (including undertaking agricultural research on input marketing and adaptation to specific users), but also advise farmers about the use of products they sell, and provide credit to farmers. Marketing and processing firms are also critical, as they are typically the main sources of innovation to reduce post-harvest losses and develop new export markets. And NGOs have become

important actors in spreading technologies, especially natural resource management practices regarding soil and water management, watershed development, and social forestry. They have a particular advantage in helping communities take collective action to implement improved natural resource management practices at the landscape level.

Many African countries are too small to maintain comprehensive R&D programs for all their important crops and livestock. R&D links across countries in Africa need to be strengthened to obtain economies of scale in research on problems of common interest (e.g. major crops or pests) and to invest in biotechnology and bio-safety regulation. Regional networks and the international research community, including universities and the CGIAR will be critical for short and long term improvements in the supply of technology.

In terms of information technologies, the generally weak state of Internet connectivity in Africa is affecting the region's ability to compete effectively in today's fast-paced marketing environment. According to some recent estimates, the region has roughly one Internet account for every 250 people, compared to a ratio of one in 50 for the rest of the world (AfricaLink, USAID/AFR/SD).

Even as African agricultural research and extension systems are being asked to take on more diverse and difficult challenges, their budgets are also being cut in many countries (Pardey et al, 2001). NARS in Africa have been particularly badly hit, and the availability of resources per scientist has fallen sharply. The private research sector remains a minor player in Africa and is unlikely to grow in importance until such time that African farmers achieve a level of commercialization that makes private sector research profitable. This may not happen for a decade or more even if Africa is successful in launching more rapid agricultural growth. On average, African countries spend about one half of one percent of their agricultural GDP on research, which is much less than the 2 percent averaged by the industrialized countries (Pardey and Beintema 2001). Despite the high population numbers in Asia, Africa still spends much less per agricultural worker person than Asia (Figure 18). If the needed technologies are to be developed to address the poverty and environmental problems of developing countries, and to enable them to capture some of the potential benefits of biotechnology, then there is an urgent need to increase the available funding and to implement the needed institutional reforms.

Research Intensity Ratio Expenditures per economically active agricultural population, 1993 International dollars	**1976**	**1985**	**1995**
Sub-Saharan Africa	**$11.3**	**$10.6**	**$9.4**
Asia (excluding China)	**$3.8**	**$6.1**	**$10.2**
Latin America	**$26.0**	**$36.0**	**$45.9**
Developed Countries	**$238.5**	**$371.0**	**$594.1**

Figure 18: R&D Expenditures per Agricultural Worker
Source: Pardey and Beintema (2001)

Markets and Trade

Globalization, trade liberalization, and changes in lifestyles and demographic trends present opportunities for growing markets for African agricultural goods (Box 3 below). Demand changes have come about in the industrialized countries from increased demand for variety, quality, niche products such as organic foods and year-round demand. In the developing world, income growth, urbanization, and a shift away from staples consumption present new opportunities as well. These same trends are emerging even within Africa and, given current low levels of consumption, there is considerable potential to expand domestic and regional markets for food staples, higher value crops and livestock products, and processed foods as per capita incomes and urbanization grow.

Given declining trends in its share of global agricultural trade, mostly as a result of the declining terms of trade for its traditional exports (see Figure 7 in Chapter II), Africa will need to raise its competitiveness in those commodities and products that it has a comparative advantage, for both specialized (e.g. environmentally friendly and/or out-of-season tropical products) and traditional markets (e.g. cocoa, coffee, etc.). In many cases this can be done by simply improving product quality, as well as reducing transaction costs along the production and marketing chain (see Box 6). Additional improvements can also be achieved through agricultural R&D.

Box 6 Africa's high market transaction costs

Across much of Africa, the final price of agricultural goods is 3 to 5 times the price that farmers receive. For example, while it cost only $38 to transport a ton of corn from Kansas to the Kenyan port of Mombasa in 1995, it cost $115 to transport that same ton form the town of Kisumu some 300 km inland.

In many places, high transaction costs leave small-scale producers in isolated areas out of the market altogether. The weakness of rural markets is partly a problem of poor infrastructure, particularly roads and communications systems. But it is also equally due to the weak institutions that support markets, such as information systems, grades and standards, and institutions to bring buyers and sellers together. Problems with quality standards, timing, and assuring adequate supply are penalizing local products in both domestic and international markets. This is because global market trends have introduced new demands in the form of product quality specifications, food safety issues, environmental concerns, and other emerging mandates, all of which affect the competitiveness of tradable goods and services in the global marketplace (Delgado and Minot, 2001). Few African countries have the capacity to meet many of these stringent demands if they are to benefit from growth in global trade.

It is now widely recognized that the market reforms have been necessary but were not sufficient to generate greater supply response and competitiveness in export markets. Market liberalization removed major distortions but the results have proved disappointing

for agricultural growth, export performance and poverty reduction because they did little to ensure that small-scale farmers, particularly those living in areas more remote from roads and markets, could benefit. Even in areas close to export and domestic markets, the response may have been mixed because reforms have either been incomplete or inconsistent (Jayne at al. 2002).

Box 7 When Markets Work or Don't Work

When Markets work – producers respond. In Mali for instance, the liberalization of the rice market has led to a tripling of production over the 1990s as small-scale processors and traders successfully halved the marketing margin from producer to final consumer price. Similarly, the liberalization and development of dairy markets in Kenya has led to dairy production becoming the fastest growing source of income for over 600,000 small farmers operating 1 to 3 cows.

When markets don't work – the effects can be significantly negative for smallholders. The current maize price crisis in Ethiopia follows a 5 year period of 40% yield increases and more than one hundred percent increases in fertilizer applications, leading to a 50-60 percent drop in output prices, to levels below production costs. This had led to a reduction in fertilizer adoption by 38%, thus compromising future gains in productivity (Kuma, 2002). Similarly, at the onset of trade liberalization in Cameroon, the entry of some 600 exporters resulted in a fragmented private export sector for cocoa that proved to be less competitive on world markets and resulted in not only a loss of Cameroon's quality premium, but a discount for its cocoa, ultimately reducing smallholder incomes.

As a result, in today's post-reform era domestic markets remain largely unable to deliver the production and income gains expected from market reforms. Constraints can be seen at three levels: implementation of reform policies, infrastructure to support markets, and institutions to enable private market performance (Kherallah et al, 2002). Markets continue to be characterized by high transaction costs; limited and asymmetric market information; lack of coordination; missing markets for storage and finance; lack of smallholder market power; and increased risk (Gabre-Madhin, 2001). Where markets are functioning (or not) has had important consequences on smallholder incomes (Box 7).

What is needed most in Africa are the integration of African markets into the global and regional economy through a stable and enabling policy environment; infrastructure such as feeder roads, telecommunications, and the logistical apparatus to capitalize on existing infrastructure; institutions to reduce transaction costs, redress missing markets, reduce risk, enable collective action, and build social capital; and a focus on individuals in terms of unleashing their innovative spirit and strengthening their capacity, both for policy analysis as well as private sector participation in markets. Non-governmental organizations (NGOs), community-based organizations (CBOs) and the private sector could play a greater role in facilitating the development of effective marketing institutions, particularly in remote areas.

Producer and Community-Based Organizations

Structural adjustment and market liberalization that removed government from many market and service functions has created a vacuum and opportunity. The hasty retreat of government from service delivery to rural communities without a credible back up plan or set of alternatives in place has left many communities and farmers fending for themselves. In many cases these shocks have worsened the conditions of rural communities and created political backlashes, causing backsliding on market reforms.

While the private sector is emerging as a key player in linking larger scale commercial farmers with markets[4], voluntary community based organizations (CBOs) of various types have important roles to play for smallholder farmers (Kindness and Gordon, 2002). First, they can help provide the basic linkages between farmers (especially small scale farmers) and businesses (food processors, manufacturers, traders and food outlets) and research groups that do not have the ability or will to deal with small scale farmers on an individual basis. Numerous examples exist from the works of NGOs like ACDI/VOCA, Sasakawa Global 2000, Africare, etc. (Box 8). Second, and

Box 8 The National Smallholder Farmer's Association of Malawi

The National Smallholder Farmer's Association of Malawi (NASFAM) grew out of an ACDI/VOCA Smallholder Agribusiness Development Project (SADP) launched in 1995 with USAID support. The purpose of the project was to assist smallholder producer organizations to access markets through strengthening their business and marketing skills, improved grading and packaging, and better organize transport and bulk purchase of inputs.

NASFAM has continued to experience phenomenal growth in membership, increasing from 2,200 in 1995 to over 90,000 in 2001, a testament to the significant income gains from membership. Through NASFAM, farmers have been able to exercise collective bargaining powers to improve market efficiency and trade contracts, such that transportation costs have been reduced, tips and bribes along the supply chain have been eliminated, losses from damaged or diverted goods have been minimized, and delivery times have been shortened by more than 60%. Access to inputs like fertilizer have also been improved, resulting in 5,400 tons of fertilizer (worth $1.7 million) being purchased in 2000 by members with total cost savings of about $114,000 and with NASFAM gaining $12,000 in the process.

Source: ACDI/VOCA (2001) – downloaded from the World Bank's website

through such linkages, they can help create opportunities and add value to producer efforts, and help serve businesses by providing an efficient conduit to reach producers. Third, they can play a central role in gaining value from market and trade systems

[4] In fact, a key lesson from the maize successes of Eastern and Southern Africa is the strength of private farmers unions initially organized by large-scale settler farmers (Smale and Jayne, IFPRI working paper).

development, investments in technology systems, and improving access to credit (for examples, see Kindness and Gordon 2002). And finally, effective producer organizations can help empower the rural poor and add to the social capital of a community, which all contribute to the likelihood of effective cooperation in other areas, such as natural resource management and a better articulation of local development needs.

Based on the evidence and experience, investments in strengthening community and producer-based organizations can lead to lower marketing margins and higher prices for producers; improved product quality; increased access to extension, input and financial services; and greater participation of the rural majority in decision making processes (as in Box 8). Such that jobs are created through various off farm enterprises (e.g. agro-processing) and farmers do business better. But to be effective they need to be very different from the old state cooperatives that are widely discredited because of their poor performance and high cost. Key design principles are organizations that are voluntarily organized, economically viable, self-sustaining, self governed, transparent and responsive to community and producer-based groups.

Supporting these kinds of organizations will require government and donor support, engaging with businesses, NGOs and civil society groups. It also creates the demand for services to help government, donors and businesses validate and certify the professional credibility and validity of community and producer groups. Community based organizations will also need help in developing business and management skills, establishing information systems and pathways that connect rural communities to domestic and global markets and knowledge systems, creating good governance practices, creating the infrastructure to connect the small holders to finance and input supply systems.

It is not required that farmers who organize to do all the work themselves, but for farmers to take over the governance (oversight, decision-making), and then hire professionals that are accountable to them. Training in accounting and a number of skills becomes critical support that these organizations need to get from somewhere--government, NGO, or someone. This may also apply in the producer organizations area (esp. with value-added processing). The boundaries between this and a private company then blur (as they do in the US farmer coops), but the critical difference lies in the accountability to farmers.

People and Institutions

The development of human capital and institutions is critical for achieving agricultural growth, both at local and national levels.

Over the past decade there has been significant policy reform but only limited institutional reform at the national level. Many of the institutions that were created during central government control of markets and services found themselves ill equipped to work in a liberalized market environment. Good policies and investments can go sour

not because they are poorly conceived, but because the institutions that implement them do not work well.

Investments in building public and private sector capacity and institutions for successful rural growth should be aimed at building capacity to: manage public policy to support pro poor agricultural development; attracting and mobilizing investment; provide technical services, such as research, product certification and inspection, information; provide access to agricultural training and education, especially for children in rural areas; and enforce contracts, laws and property rights. A conducive institutional environment will also play an important role in improving overall macroeconomic and sectoral policies which can affect the incentives for private sector investments and growth (Kydd 2002).

Reform of public institutions must overcome vested interests, otherwise new forms of intervention and rent seeking simply replace old. New innovations may be needed. For example, increased donor support of key public sector investments could come from new financing arrangements that empower the users of public services (e.g. vouchers, user fees and other co-financing mechanisms) and with appropriate institutional reforms to improve mandates and performance. There is also need to form new partnerships between the public, private and NGO sectors for the provision of public services. Even though government must pay for many of these goods and services, it does not mean that the public sector has to deliver them. Recent years have seen considerable success in using NGOs and CBOs to deliver targeted assistance to the poor, and private firms can be contracted to build and maintain schools, health centers, roads and the like. Contracting out arrangements with other parties can be much more cost effective, and may offer better possibilities for involving local people and communities. The types of partnerships desired will vary by sector and function, with many more opportunities to diversify supply arrangements for education and health services, for example, than provision of rural roads and market regulation.

Effective public institutions also require an adequate supply of trained people, including agricultural policy advisors, agricultural researchers and extension workers, business managers, and financial and computer experts. Past investments in training Africans did help increase the supply of some types of key personnel, despite the fact that many did not return from overseas training. But HIV/AIDS, ageing, and low salaries and morale within public institutions have contributed to chronic staff shortages.

The kinds of demand driven and participatory development needed in most of rural Africa will not happen without more effective devolution of many planning and implementation decisions to the local level. This requires stronger local government and community organizations, and a greater willingness on the part of many governments to empower and transfer resources to these organizations. This is particularly required for the upkeep of investments in rural infrastructure (through local ownership and co-financing arrangements), and for the management of many natural resources.

Farmers need assured long-term access to land if they are to pursue sustainable farming practices and to make long term investments in improving and conserving resources. Many of the indigenous land tenure systems that prevail in LFAs do provide reasonable tenure security to those who have access to land, and they also seem to evolve to accommodate changing needs (e.g. greater privatization of rights) as population and commercialization pressures increase (Bruce and Migot Adholla 1993; Place and Hazell, 199). In these cases, the appropriate role for government is to seek ways of strengthening existing systems rather than imposing new systems. Legal registration of land by community groups and simple measures for recording land transactions and resolving disputes can often increase security by reducing land disputes between and within communities. By contrast, registration of individual plots will only be worthwhile in areas of high population density, where land has a high value, where formal lending institutions are also well developed, and land is already effectively privatized. It may also be required in areas of new settlement, where there are no indigenous land tenure systems and disputes over ownership and boundaries are common.

Many natural resources are owned and managed as common property in Africa (e.g. grazing areas, woodlands, water, and wetlands). There are usually good social and economic reasons for this (McCulloch Knox et al., 1998), but if these resources are to remain in common ownership and avoid being privatized or over-used, then governments need to recognize local rights and capacities to manage these assets. Often, governments have undermined indigenous institutions by nationalizing important common property resources, such as rangeland and forests, while being unable in practice to manage them effectively. As a result, many common property resources have degenerated into open access areas. There is now increased acceptance that the most successful institutions for managing common properties are likely to be local organizations, run by the resource users themselves. Government policy needs to support local management by such groups, while at the same time ensuring that poor people are adequatley represented in their management.

Conserving or improving natural resources often requires collective action by users, even when the resources are not commonly owned. Examples include organizing neighboring farmers to invest labor in terracing their common water catchments, and joint planning of biological pest control. In many places, collective action by farmers is a normal part of life. Elsewhere, greater support is required – institutional, socio-economic, technical – to organize farmers into effective and stable groups. Non-governmental organizations have sometimes played a key role in helping communities to overcome these constraints, and in helping to ensure that the poor have adequate voice. Collective action can also be a powerful way of increasing poor peoples access to natural resources.

Human capacity training has often been biased against women. Yet women play a key role in agriculture, especially smallholder agriculture. Investing in women's general welfare is a 'win-win' strategy for reducing hunger in Africa. Women in rural Africa are farmers, entrepreneurs, and nutritionists (being responsible for managing the daily nutritional intake of their households). Most rural women not only have to produce, harvest and process food staples (such that they provide over 70% of the total agricultural

labor force), they also have to prepare meals and look after the welfare of their children, the sick and the elderly. Yet, in spite of their key roles in the food production systems, development priorities have too often been biased against them. They have often faced fewer opportunities to access to: modern inputs, especially labor saving technologies that can ease periodic bottlenecks; land ownership; information and extension services; primary education; etc.

Given these constraints, some studies have concluded that if women had equal access to modern inputs for instance, food production in Africa could easily increase by as much as 15% (Saito et al. 1994, cited in World Bank's Strategy paper). Meanwhile, providing access to education and food production inputs has also been to shown to have a direct impact on reducing malnutrition among children under 5 years of age (Smith and Haddad, 2000). Therefore, if a strategy to reduce child malnutrition is to be successful, gender biases will need to be seriously addressed.

Targeting Vulnerable Groups and Creating Safety Nets

Broad-based agricultural growth centered on small farms could make deep inroads into poverty and hunger in Africa. But it will not be enough to eliminate poverty or to reach the poorest of the poor. There is also need for targeted investments in the poor and effective safety nets. The most important targeted interventions for the poor are the ones that increase their health and education, increase their access to assets (especially land), which empower them more generally in their dealings with others, and which provide safety nets in times of crisis. The need for access to resources is particularly urgent for landless and near-landless people, many of whom are women.

Most of the chronically poor are poor because they have limited access to land, skills, capital and other assets needed to respond to growth opportunities. At the same time, most of the poor are rural and live in areas that have poor infrastructure and have poor access to markets, health and training centers, and the like. Many among the poor are exposed to high risks in the market place: market liberalization and climatic risks have increased food price volatility in many countries. Exacerbating these problems is the spread of HIV/AIDS, malaria, tuberculosis and other contagious diseases, which is draining the limited resources that poor people do have and are introducing serious inter-generational consequences in terms of asset accumulation, growth and poverty.

The increasing conflict within and between many countries is making matters worse for millions of people. In 1999, 14 African countries were embroiled in conflict (affecting more than 100 million people), generating 18 million refugees and shrinking food production anywhere from 3% in Kenya to 44% in Angola (FAO). Devolution of relief efforts to civil society has avoided many of the bottlenecks that plagued public distribution. But relief has become more independent of government development efforts, exacerbating long term dependence on assistance and reducing the amount of resources available for development. The cost of disaster assistance is becoming a major financial burden for many governments and donors, and the cost is escalating as more

people live in vulnerable areas and as global climate change increases the frequency and severity of many natural disasters.

Poor people have complex livelihood strategies and agricultural development is rarely sufficient on its own to eliminate poverty. Increased investments in rural health, education and training, in conjunction with agricultural and nonagricultural investments are also needed to reduce vulnerability. Multi-sector approaches to reduction of malnutrition are essential, involving the promotion of health, education and clean water as well as increases in food supplies and non-farm sources of income.

There have been real advances in recent years in targeting and delivering assistance more effectively, often by involving local communities in the design and implementation of targeted programs. This can lead to programs that are primarily demand driven and hence reflect local needs and constraints. Some key lessons from recent experiences are summarized in Box 9.

Box 9 Key Lessons in Building Programs to Reduce Vulnerability

In building programs to reduce vulnerability and accelerate the transition from disaster to development, two key lessons stand out: 1) the importance of developing ***"self-targeting" programs*** that minimize the distortion of incentives and leakage to the non-poor, and 2) the importance of ***"productivity-enhancing" programs*** that offer new opportunities for those affected by disaster to permanently improve their livelihoods.

The most fundamental type of self-targeting programs are food-for-work (or cash-for-work) programs, such as those used successfully among drought-vulnerable populations in Botswana and Cape Verde, where people work on public projects in poor-rainfall years, and work on their own farms at other times. The most fundamental type of productivity-enhancing program is the public distribution of improved seeds, such as the distribution of improved sorghum seeds in Zimbabwe after the 1992-93 drought, or the distribution of improved bean seeds in Rwanda after the genocide.

Land market mechanisms have recently been used in some countries in Southern Africa to redistribute land in favor of the poor, making use of the 'willing buyer - willing seller' principle for voluntary land transfers (Binswanger and van Zijl 1999). However, the effective application of this market-assisted approach requires well-developed mortgage financing, strict control of land prices (to reduce speculation) and a range a complementary support services (credit, training, extension, marketing). Better options are government sponsored land redistributions (though politically difficult), more effective land rental markets (Mearns 1999), and organization of the poor to obtain greater access to common property resources and their management. There is also need to strengthen property rights over the resources that poor people and other disadvantaged groups already have, e.g. stronger land rights for women within households and for indigenous people over communal resources and tribal lands.

Micro-finance institutions have proved an effective mechanism for providing services and increasing the assets of the poor. But they are valuable mainly for non-farm investments. The seasonal nature of farm credit needs and the highly covariate nature of most production and marketing risks undermines the viability of borrowing groups for farm credit purposes. With the demise of publicly funded agricultural development banks, most small farmers now have to rely on self or family financing, using livestock and other assets as well as remittances from family members in non-farm employment. Improving smallholders' ability to save and invest requires the development of an entire rural financial infrastructure in which farmers can access a full range of financial services, including credit and deposit banking at competitive interest rates.

Institutional arrangements, such as CBOs and cooperatives that connect smallholder and near landless farmers with markets for agricultural and nonfarm products can also assist them diversify into labor intensive and high value products. Small-scale farmers and women farmers should also receive greater priority in agricultural research and extension programs.

Environmentally Sound Development Pathways

Land degradation and the unsustainable use of natural resources are limiting the potential for agricultural development in Sub-Saharan Africa. Encroachment into fragile areas, reduced fallowing, continued low levels of input use and limited adoption of available resource conserving practices underlie the problem. Improvements in marketing and access to input services and credit will be important for promoting more widespread adoption of these technologies. In some cases, farmers also need more secure property rights, or more effective local institutions for managing common property resources. Growing population pressure can sometimes help induce the adoption of labor intensive technologies to improve land and other resources and reduce degradation (Boserup, ;Tiffen et al.,), but in practice sustainable pathways to intensification typically require other key interventions too, such as improved access to roads and markets, nonfarm income earning opportunities and improved technologies (Pender et al., 200).

Government, NGOs, CBOs, the private sector and individuals all have a potential role in the dissemination of inputs and information on technologies that will lead to improved land management. In general, strong community based institutions offer the greatest potential for the exchange of information on new technologies. Strengthening farmer organizations and other CBOs will facilitate innovation and adoption of natural resource conservation technologies. NGOs also have significant potential to have a lasting impact on land management through the development and dissemination of land management technologies and by organizing communities for successful collective action. Despite the potential for increased involvement of NGOs, CBOs, and the private sector, governments still have critical roles to play in ensuring that technology development and dissemination efforts are adequately financed, that environmental and other externalities are taken into consideration, and that effective strategies suited to marginal areas and the poorest rural people are pursued.

Although many of the interventions already mentioned will improve incentives and local capacities for rural people to manage natural resources in more sustainable ways, this will typically not be sufficient to achieve the levels of environmental stewardship demanded today by national and international interests. A fundamental problem remains in that markets do not reward rural people for the environmental services they provide when they grow trees, protect watersheds, conserve biodiversity and so forth. Without such compensation, rural people will provide less of these services than desired by society at large.

A common solution to this problem is for government to regulate some resource management practices. For example, tree cutting is often banned or regulated in hillside areas, and certain land uses may be prohibited at sites where they are particularly degrading. At the extreme, sites of especially high environmental value are often converted to parks or conservation areas. The difficulty with these approaches is that they tend to work against the interests of local people, worsen the plight of the poor, and create incentives to cheat, all of which adds to the difficulty and cost of a regulatory approach.

More promising approaches are based on emerging markets for environmental services. Such markets can change incentives and benefit the poor. For example, as a result of global agreements to cut green house gas emissions, markets already exist that provide for payments from large energy using firms (e.g. oil and electricity companies) for each ton of carbon sequestered in forest or farmland. High transactions costs and difficulties in monitoring and enforcing contracts limit the prospects for most African farmers to benefit from such markets unless they can be effectively organized for this purpose.

Box 10 Promoting environmental markets: The SANProTA Initiative in Southern Africa

The SANProTA initiative in Southern Africa promotes the marketing of environmentally friendly natural products. A network of 30 rural producer organizations from five Southern African countries established regular and fair trade relationships with both regional and global markets. Products include confectionery, cosmetic oils, health care products (with the Body Shop as a major client), herbal teas, jams, nutritional supplements and medicinal products. SANProTa plans to involve about one quarter million rural producers and aims for an annual export turnover of USD 30 million.

Green labeling and fair trade arrangements are another way of trying to capture higher prices to pay poor producers for some of environmental benefits that they generate. There are several successful examples involving nontimber tree products, such as nuts, honey and medicines (see Box 10 on the SANProTA marketing initiative in Southern Africa). As more countries formalize property rights over genetic resources, there may be new opportunities for communities to use farmers' rights to collect royalties on some of the indigenous biodiversity that they conserve.

Innovations along these lines are constrained by the lack of an

expressed market demand for most environmental services. Although environmental services are increasingly appreciated by society, there is little tradition or expectation of having to pay for them. International environmental agreements (e.g. the Kyoto agreement to reduce carbon emissions) can be effective in bringing the needed pressure to bear, and perhaps similar agreements can be developed for some other environmental services.
nvironmental management contributes to agricultural and rural sector growth through the conservation and production of environmental goods and services that generate public and (or) private economic benefits; by making agricultural production and water management environmentally sustainable; and by reducing or reversing degradation caused by agricultural interventions.

New and emerging technologies such as biotechnology and geographic information systems (GIS) also offer opportunities for better management of natural resources. Remote sensing and GIS tools allow for empirical analyses of land use change over time and in a spatial context. Biotechnology to raise productivity allows farmers to produce more output with less exploitation of natural resources. For many regions of SSA that are dependent upon one or two staple crops that suffer from pests and diseases, new crops that offer resistance have enormous potential implications for food security and rural livelihoods in general. As food security and incomes improve, farmers will be more likely to invest in natural resource management technologies.

Strengthening Multi-Sector Linkages

Multi-sector approaches to reduction of malnutrition and poverty are just as essential and basic as investing in infrastructure and rural services. These involve the promotion of health, education, clean water as well as increased food supplies and non-farm sources of income. Further, integration of HIV/AIDS education, health care, and family assistance into agricultural projects and rural investments have positive impacts on rural livelihoods and agricultural growth. According to IFPRI's IMPACT model simulations, it is estimated that to meet the targets for cutting hunger, access to clean water will need to increase from 48% of the rural population in 1997, to 80% in 2015. And, female access to secondary education will need to increase from 18% in 1997 to 45% in 2015.

Investments can and should be more precisely targeted to the poor. Better cooperation is needed across sectors at the community, national and international level in shaping and targeting development assistance. This will be made easier and more effective using new research and data at the spatial, community and household levels that help target who, where and why assistance is needed. And, increasing the participation of communities in designing and implementing assistance programs improves their effectiveness, and can assist in integrating efforts across sectors as well as integrating relief and longer term development assistance.

V. Implementing a Smallholder-led Growth Strategy

Previous sections have identified key pillars of a smallholder-led agricultural development strategy for Africa. But crafting these pillars into national and regional development plans and efforts requires setting up and managing an appropriate process of change. This challenge lies at the heart of USAID's Initiative (AICHA) and is the subject of this chapter.

Political Commitment and Investment Alliances

African leadership is paramount if progress to cut hunger and malnutrition is to be sustained. And it is African leaders who, through initiatives such as New Partnership for Africa's Development (NEPAD), need to put agriculture at the center of economic growth and poverty reduction in Africa to tackle these challenges. Experience demonstrates that where African leaders are committed to agricultural growth, donors can partner with them to jointly achieve significant results. The commitment of Uganda's leaders to investing in agriculture and rural development is one example. Poverty took a substantial drop in the 1990s; from over 50% to 35% of the rural population.

The efforts of African governments will also need to be matched by increased support and alliances, both financial and otherwise, from other key agents of change, including international development agencies, private sector investors, civil society, universities, and local communities and farmers. Significant additional investment funds are needed, but success will be greater if the investments made by governments and key donors are also better coordinated than in the past and linked to a common development strategy.

Unleashing Sub-Regional Dynamics

Promoting agricultural-led growth at the Africa-wide scale will be difficult to achieve with the levels of funding that are likely to be available without building on sub-regional platforms that will strengthen linkages and generate mutual benefits across countries. There are also important efficiency gains to be captured from such a regional approach. Given the number of countries in sub-Saharan Africa, their small sizes, and their shared political, socio-economic, cultural and physical constraints, it is likely that for some kinds of investments, country specific programs would not be the best approach and powerful regional dynamics could be unleashed leading to larger total benefits by investing more broadly across countries. For example, larger economic gains might be realized for groups of countries by improving marketing channels across borders in a regionally integrated manner, either through road infrastructure or market information systems, rather than by taking purely national perspectives. This is especially true for many of the landlocked countries that face exorbitant transportation costs to move goods and services across borders. Countries can also gain from shared investments in agricultural research and development, especially when they grow some of the same

crops under similar agro-climatic environments. In this case, investing in R&D in regionally integrated programs can have a greater impact than simply investing the same amount of resources in country specific programs. Moreover, through more integrated and competitive markets, countries can specialize in those products they have a comparative advantage in, improving economic efficiency and unleashing regional growth dynamics that will ultimately help reduce the incidences of hunger and poverty across multiple countries.

Exploiting many of these regional growth dynamics will require greater collaboration between countries, facilitated by regional initiatives, especially on market and trade policies and regional R&D investment strategies. Regional cooperation and harmonization of trade systems can play a critical role in creating opportunities for farmers and firms at the national, regional and international level (see example of seed trade in East Africa, Box 11). In the long run, regionalization will help attract investment and increase efficiency in agriculture by making it possible for firms to reach consumers and producers in multi-country markets. Within the South African Customs Union, for example, agribusiness firms compete across Botswana, Lesotho and Swaziland as well as South Africa, significantly increasing the efficiency of seed and fertilizer marketing as well as the quality of poultry genetics and veterinary services for livestock.

Box 11 Harmonization of Seed Trade in East Africa

Facilitating such regional trade has become a high priority of the sub-regional research organization (ASARECA), whose policy program (ECAPAPA) has successfully lobbied for harmonization of seed registration rules to facilitate seed trade. Quite significantly, USAID has been a key supporter of all three of these developments: the successful Kenya maize breeding programs of the 1980s, the successful Ugandan agricultural reforms of the 1990s, and now the regional-trade initiatives of ASARECA in the 2000s. Because the Kenyan private sector can market its own hybrid maize seed successfully in Uganda which does not yet have a competitive seed system, yet now exports maize to Kenya, there have are very large gains from selling high-performance Kenyan maize seed in Uganda, and low-cost Ugandan maize grain in Kenya.

This example demonstrates the important synergy between new technologies and market development, as well as the importance of regional programs for national success.

Harmonization of regional markets can help speed up and improve the efficiency with which food crises and shortages can be addressed, hence helping to avert the deepening of hunger problems such as that currently being faced in southern Africa. Regional cooperation can also help accelerate the integration of African countries into global trade systems, through common negotiating positions in the WTO and other fora. Regional cooperation can play a catalytic role in creating the scale and scope of market demand needed for agricultural growth, especially for small countries and new types of commodities.

Regional investments should be seen as complimentary to investments at the national levels, and with proper linkages, they can leverage the payoff from national investments.

For the operational purposes of USAID's Initiative (AICHA), regional investments will be planned and implemented for three sub-regions: East, West and Southern Africa. For each region, Regional Action Plans will be developed that are linked and harmonized to National Action Plans in selected countries, All Action Plans will describe the process by which investment priorities and related analytical agendas will be developed, fine-tuned and acted upon (a graphical illustration is presented in Figure 15). USAID describes the Action Plans as documents that will include a 15-year vision of the initiative, specific programmatic thrusts for a five year planning cycle, and work plans and outputs targeted for the upcoming annual cycle. They are expected to be "rolling" planning documents that will also provide monitoring and evaluation information in accordance with a results framework established in the first Action Plan.

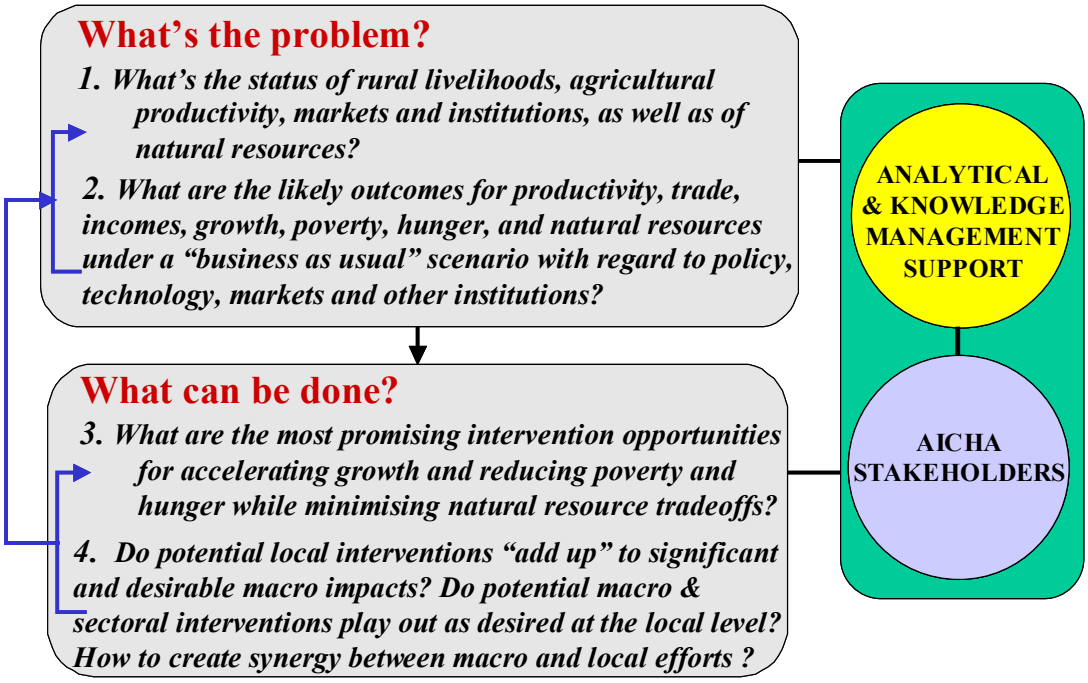

Figure 19 Analytical and Knowledge Management Framework

As USAID's regional Action Plans are prepared, the following are likely to be the key questions driving the analytical agenda:

- To what extent can agricultural research, public investments and regional trade have positive spillover effects across the region? How can these spillovers be exploited in developing investment strategies at the regional level?
- Do sizeable markets for agricultural output exist (or can they be developed)?
- How large are the potential impacts of agricultural growth on incomes and poverty?

The third major component of a Regional Action Plan would be an assessment of the likely impacts of the planned investments on the countries in the region on (a) overall economic and agricultural growth, (b) agricultural trade, (c) intra-regional trade, (d) spillover effects through intra-regional linkages in commodity and factor markets, and consequently (e) regional growth, development, and poverty reduction. This effort would aim at identifying the specific countries and sectors having the most promise for export expansion and diversification and that might, hence, serve as engines of growth.

Given the broad policy issues described above, individual Regional Action Plans might provide or call for analysis on questions such as: What effects will different investment strategies have on agricultural growth, trade expansion and diversification, as well as poverty reduction? How can focus countries and sectors be screened for concentrated investment? And, how can these national and sub-regional development efforts be integrated with a global trade strategy? In order to analyze these issues, studies might need to be identified and commissioned that will gather appropriate information on, for example:

- The major factors that increase transactions costs and inhibit trade across countries (lack of product grades and standards, non-harmonization of trade and market policies, lack of marketing institutions, inadequate infrastructure, PSP regulations, etc.). Microanalysis may need to be used to explore the level of marketing margins for trade within and outside of the region and assess the possible impact of investments, policy changes and institutional development in reducing these transactions costs.
- The implications of greater market integration for agricultural prices, incomes, consumption, and food security for the countries of the region. Such analyses should focus on major agricultural products (e.g. maize, rice and cassava) and involve some model-based simulation of key markets.
- The economic returns to agricultural research on crop and livestock productivity at the national and regional levels
- The most appropriate investment strategy: concentrated investment in focus countries or broadly spread investment in the entire sub-region? And how this might vary by type of investment?
- The kind of investments that will generate the highest growth and spillover effects, e.g., sector-specific, infrastructure-oriented or R&D. Such as looking at the potential for agricultural research to increase productivity in various ecologies within and across countries in each region will need to be assessed, taking account of potential spillovers among countries.
- The compatibility of regional investment and development efforts with ongoing global trade liberalization under the WTO
- The complementarities in promoting domestic, intra-regional, and international trade among different commodities, considering the changing global trade environment

National Action Plans

The Initiative plans to invest in a few focus countries where the chances of success and scale of potential impacts promise to be higher. These will also be countries that can serve as nodes of agriculture-led growth within their sub-regions. To obtain such growth dynamics (or spillovers) at the sub-regional level, it is expected that the focus countries will be as representative as possible of other countries in the region, in terms of the characteristics of their economies and agriculture, and/or the level at which they have a strong leadership capacity, in terms of policy reforms, public investment and government commitment to agricultural growth and poverty reduction. These are countries with an enabling policy environment that is conducive to private investment, countries that can play a leading role in the sub-region to promote regional cooperation and agricultural growth, and finally, countries that support broader political participation that is essential for good economic and policy management. They will also most likely be those countries that have a good track record as development partners and already have a strong USAID presence.

National Action Plans are expected to provide the context of agricultural development constraints and opportunities, and propose specific investment priorities and implementation strategies. The National Actions Plans should be seen as dynamic and continuous, incorporating monitoring and evaluation (M&E) systems so that their implementation and impact can be monitored, lessons learned, and Plans adjusted over time as needed. They should also be strongly linked to government-led and other initiatives such as PRSP's.

Although the specific emphasis of National Action Plans is likely to vary from country to country, there are criteria that if properly addressed, should ensure the relevance of actions to the Initiative's goals, and the development of an appropriate investment portfolio. These include:

- Coordination and collaboration: Demonstration that the National Action Plan is harmonized with the relevant Regional Action Plan and can be expected to lead to regional synergies; consistency and linkages with other proposed investments, including national, regional and global initiatives (e.g., NEPAD, FARA), other bilateral aid programs, and other USAID programs; since the AICHA is predicated on supporting an Africa-led initiative, this must translate into clear mechanisms for stakeholder participation in the design, implementation and evaluation of investments and activities supported by the Initiative.
- Measurable indicators of progress: Measurable indicators of progress towards the goals of the Intitiative must be identified, and the means of establishing baseline indicator values proposed. These should fit into an M&E framework to be established in the first Action Plan.
- Scale of impact: Plausible evidence of how significant advances in agricultural growth, food security, poverty reduction, environmental conservation and the like will be attained if the investment plan is successfully implemented

- Economic consistency: Analysis to assess whether projected levels of production of important commodities are consistent with what markets (domestic and export) can absorb at prices that are acceptable to producers.
- Local diversity: Consideration of how sector and national scale (macro) interventions will play out and be reconciled with the broad array of conditions faced by farmers at the local (micro-watershed or community) scales. This is a particular constraint given the considerable diversity in agroclimatic and market conditions experienced in most African countries.
- Environmental sustainability: Explicit treatment of the sometimes conflicting interests and decision rights of the individuals and communities who manage natural resources with the environmental concerns of national policy makers and the international community.

For the most part, there is a high degree of overlap among the data and analyses that might be needed to address these investment criteria. The preparation of Action Plans could, thus, benefit significantly from access to core sets of appropriately structured, existing information as well as an analytical capacity to generate new, goal-specific information. The Initiative, therefore, expects to support Missions in gaining access to such capacity where it is required.

Although the specific information needs of each Mission will vary, a core set of shared information and analysis needs might include:

- Survey-based micro data (e.g., households, communities and markets) to characterize target areas and livelihood strategy options
- Assessments of the likely baseline outcomes under a "business as usual" scenario in terms of productivity, incomes, nutrition, and potential land use conflicts
- Assessments of the location, nature and scale of potential development opportunities and interventions, e.g., maps showing where current and potential livelihood options are strongly divergent, or assessments of the likely geographical and socioeconomic distribution of the effects of productivity changes in specific agricultural sectors
- Analysis of proposed options (e.g., policy, technology, institutional) for resolving tradeoffs between agricultural development and other goals (e.g. environmental, HIV/AIDS-related).
- Assessments of the consistency between national commodity and factor markets based on the types of proposed AICHA interventions. The type of market analysis tools appropriate for this purpose can also be applied to evaluating the impact of market and trade reform policies and investments.
- Identification of key M&E indicators, and establishment of benchmark data sets.

Such assessments will need to draw on a range of data and analytical tools that operate consistently across scales within and across the national and regional efforts supported by the Initiative. The scope and priorities of the specific analytical agenda will be determined by each mission's stakeholders and partners. Furthermore, in keeping with the strategic aim of developing alliances for implementation of the Initiative, the new

information and analytical results generated by this process should be accessible to other alliance members, e.g., other bilateral or multilateral donors.

Since the development of an information and analysis capacity should be seen as a long-term aid to national planning, it is also important that appropriate institutional arrangements be set up within countries to ensure their sustained use and update over time. Planning in this way is important to inform government and USAID policy and investment priorities at the sector and regional levels, and to guide the relevant choice set for targeted interventions at the grass-roots level. But these tools cannot and should not substitute for participatory approaches at the implementation phase, especially in local communities

Analytical Rigor to Support AICHA

One way in which the Initiative expects to enhance the likelihood of its success is to apply the best available information and analytical insights to the processes of justifying, formulating, monitoring and evaluating its investments. It must be said from the outset that not all programmatic aspects of Action Plans will be equally amenable to analysis. However, the AICHA framework has been conceived with a strong analytical core. This has been done for two reasons: accountability for the significant resources that will be committed; and increased efficiency in the use of those resources by identifying the most promising investment options. One objective is to map explicit assessments of both the local and aggregate impacts of proposed Initiative investments.

The analytical framework is seen as key to instilling the necessary levels of rigor and coherence in the design, monitoring and evaluation of the AICHA portfolio. For example, in designing an AICHA's science and technology portfolio, careful ex ante analysis will be required to assess how a technology system will affect the distribution of welfare benefits and ultimately the reduction of hunger and poverty, given the existing economic and institutional settings in the country or region where it is being released. And furthermore, identifying what complementary investments are necessary to successfully disseminate the technology, especially in areas where there is extensive hunger and poverty, and most likely areas with weak markets, poor infrastructure, institutional and policy support mechanisms (Janvry and Sdaoulet 2002).

At the sectoral level, the potential for regional trade in agricultural products will need to be reviewed, as well as the implications of domestic marketing and trade policies on production, consumption, and prices. Such analyses should focus on major agricultural products (e.g. maize, rice and cassava) and involve analysis of price differentials and even some model-based simulation of key markets.

For monitoring and evaluation, two typical questions that will most likely drive the analytical agenda will include: Will the aggregate, inter-related impacts of proposed local-scale AICHA investments be sufficient to generate the required scale and speed of economic growth? Or will macro-level interventions map into desirable types of change

at the local level given the large heterogeneity of smallholder production opportunities and constraints?

The preparation and implementation of the AICHA's National and Regional Action Plans, in particular the underpinning analytical tasks, would benefit significantly from access to consistent and relatively comprehensive data and analytical support. This is particularly true for those Missions with less presence in the agricultural sector, but might also be true for those missions where the analytical capacity of implementation partners is insufficient. However, there are also data and analytical support needs at the geographic scale of the entire Initiative. The most obvious of these is the continued need to build support for, and routinely report on, the Initiative as a single U.S. government program. Despite the high priority placed on harmonization and synergy amongst National and Regional Action Plans, it is unlikely that indicators and results frameworks of each would provide sufficiently integrated or comprehensive overviews of the Inititives action and impact. Thus, it is also necessary to bring together the indicators and results of individual Plans in a consistent overall results framework for the Initiative as a whole.

There is a strong case, therefore for USAID to devote some Initiative resources to providing a pan-Africa (pan-Initiative) data and decsion-support capacity that is capable of feeding consistent information and analysis into, and drawing consistent results from, individual Action Plans. Such a program should also be linked over time to efforts to strengthen national capacities in these same areas. This will need to involve training and capacity building efforts, and setting up institutional arrangements so that the accumulated data sets and decision support systems are widely available within countries, especially to all relevant government departments and donor agencies.

VI. Conclusion

A smallholder-led transformation of Africa is both technically and economically feasible. Yet historical missteps have made policymakers and donors skeptical about the realism of achieving this vision. Any attempt to revitalize investment in African agriculture must provide convincing answers to the following key questions: What has been learned from the past? What will be different now and in the future? How can we be sure that it will work? Questions that this report has tried to explore.

Based on the lessons learned, Africa's experience with structural adjustment programs has taught us that agricultural growth requires an enabling economic environment, but simply getting prices right is not enough. There is also a complementary need for sustained public investment in the supply-side of agriculture, without which there is little aggregate supply response. The abrupt withdrawal of the state parastatals and of subsidized inputs left a vacuum in many agricultural marketing and input supply services that the private sector has not yet been able to fill. The private sector could play a larger role if it were not also constrained by some of these same factors, as well as by weak legal and financial institutions. More promising results for growth and poverty alleviation have been obtained by engaging the private sector, NGOs and community-based organizations in more participatory and demand-led interventions. But in their enthusiasm to embrace new types of agents and approaches, donors have been negligent in failing to strengthen public institutions so that they can play their properly defined roles.

One of the more successful outcomes in recent decades has been the role of agricultural research in generating technological change. Higher yielding and more drought and pest resistant varieties helped increase food supplies, even if not at a sufficient rate to keep up with population growth. Despite these successes, many national research and development (R&D) systems are still poorly positioned to address the important natural resource management problems that now confront African farmers. Furthermore, R&D for traditional export crops has also failed to raise productivity growth in recent decades, contributing to a loss of competitiveness in world markets and a decline in market shares. Africa's heavy dependence on a few traditional agricultural export crops renders it vulnerable to downturns in world prices, while its general terms of trade for agriculture has also been affected by the protectionist agricultural policies of many OECD countries.

The challenge for stimulating a smallholder-led growth in Africa will go beyond simply addressing smallholder agriculture. Building local human and institutional capacity is therefore essential. Experience has also shown us that good policies and investments can go sour not because they are poorly conceived, but because the institutions that implement them do not work well. Investments in rural health services are critical as well. Rapid population growth has been accompanied by the spread of human diseases like Malaria and HIV/AIDS which are taking a tremendous toll on public social services, labor productivity and household savings. Agricultural development can provide the resources for rural people to improve their health and nutrition – but so can

improvements in the health of rural people increase their productivity and the prospects for successful agricultural intensification. In this regard, investing in women's welfare is critical, given that women in rural Africa are both farmers and nutritionists and yet are often biased against in terms of access to economic inputs and services. Therefore, any strategy to reduce child malnutrition will need to seriously address some of these past gender biases.

With poverty and environmental degradation on the rise in Africa, civil conflict has also risen, which has now become a major factor contributing to the high incidences of hunger and poverty on the continent. What is also needed are long-term development solutions targeted at the most severely affected and vulnerable populations, going a long way to reducing hunger and poverty on the continent. Already the cost of disaster assistance is becoming a major financial burden for many governments and donors, and the cost will continue to escalate as more people live in vulnerable areas and as global climate change increases the frequency and severity of many natural disasters.

What Africa needs is a different approach for development – one that simultaneously addresses in an integrated way the pressing social and environmental problems facing Africa as it enters the 21st Century. There is now a growing consensus that the new approach must be less dependent on government direct intervention but rather based on participatory development approaches, civil society, market forces and key partnerships between stakeholders. Governments are expected to focus on creating an enabling environment in which other agents can operate efficiently, and to refrain from undertaking activities that others can do better. They need to create the right kind of economic incentives through national and regional economic policies, establishing conducive legal, governance and institutional arrangements (including decentralization), and partnering with other stakeholders in providing public goods, environmental supervision and targeted assistance for the poor. With such public investments, NGOs, CBOs, and some private agents and specialized government agencies can then focus their efforts and work together in supporting community development activities and assisting disadvantaged groups gain greater access to resources and markets.

Although we know much more about how to develop African agriculture today, there is no single one-size-fits-all strategy. There are certainly many common fundamentals (or pillars) that are shared across countries and regions in Africa, but nevertheless, each country and sub-region (East, West and Southern) will need to tailor their own national and regional plans to local specific conditions. To ensure success, development strategies needs to set in place a dynamic planning and learning process, strengthening both country and donor capacity for this type of work in the process. This will require rigorous data collection, analysis and planning; effective monitoring and evaluation (M&E) systems; and a capacity to revise and adapt plans over time. The possibilities for such an informed approach to guiding development strategies are much greater today and are constantly improving. The evolution of modern information systems, computing power and scientific methods have opened up whole new opportunities for collecting and using information in intelligent and useful ways. National capacities to undertake this kind of work have also improved. The key remaining

challenge is to find institutional mechanism through which this information and knowledge can be harnessed and better linked to the work of planners within key government and donor agencies.

The emerging consensus about how best to approach agricultural development in Africa is buoyed by existing and new opportunities for agricultural growth in Africa. The continent is still blessed with abundant natural resources on a per capita basis, which provide an important source of as-yet untapped growth potential. Yields are currently so low in Africa that there are lots of opportunities of raising them and there is considerable scope to apply already available technologies if conditions for more widespread adoption can be improved. The revolution in communications and information technologies offers exciting new opportunities. Through rapid and timely exchange of knowledge and information, it accelerates the process and quality of technology generation, it facilitates timely up-to-date market information to those who need it most – farmers and entrepreneurs, and it accelerates the process of relevant and appropriate technology transfer. Globalization is bringing new market opportunities. World markets are far more integrated today than ever before and the volume of world agricultural trade has more than doubled since 1981. Given its natural comparative advantage in producing many export crops, Africa should, with the right mix of domestic market reforms and institutional and infrastructure investments, be able to reclaim larger market shares.

Not only has the world changed dramatically over the last decade, Africa has also changed. First, in the aftermath of structural adjustment programs to remove costly public support services, various African governments have been experimenting with new institutional innovations built around private/public partnerships to help fill the void. Second, governments are also increasingly decentralizing authority to the local level, allowing rural communities to influence decisions that are relevant to their needs. Thirdly, many African countries are also instituting democratic principles of governance, and committing themselves to reducing hunger and poverty. They are well on their way to creating the type of enabling environment necessary for nurturing a dynamic business and private sector. Fourth, many African countries are now more firmly committed to reducing hunger and poverty than at any other time in the past. Finally, for the first time since independence, development solutions are increasingly being sought from a sub-regional perspective (East, West, Central and Southern Africa). This change of attitude has opened the door for many more countries to benefit from greater economic integration and to capture spillover benefits from the exchange of technology and information. For example, the emergence of the New Partnership for Africa's Development (NEPAD) is a promising joint partnership among Africa leaders that shows Africa's renewed countrywide commitment and a desire for ownership of future development priorities.

With business as usual, poverty, food insecurity and child malnutrition will worsen significantly in Africa. Resources will become more degraded and land productivity will decline further in many areas. Crises and conflicts will increase, leading to escalating costs of relief. This is not a tolerable prospect.

In the early 1960s, Africa was the continent of hope and Asia the continent of despair. Asia has shown what can be done and now Africa must move forward. This will not only require that African policy makers realign their priorities towards a greater emphasis on agricultural growth, but major donor like the US need also to step in with significant and sustained levels of support. The Agricultural Initiative to Cut Hunger in Africa is an excellent step in the right direction.

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